



TANGANYIKA TERRITORY

Annual Medical and Sanitary Report

FOR THE YEAR ENDING
31st December, 1928

Price 5/-



PUBLISHED BY
THE CROWN AGENTS FOR THE COLONIES,
4, MILLBANK, LONDON, S.W.1.

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OFFICE OF THE
DIRECTOR OF MEDICAL AND SANITARY SERVICES,
DAR-ES-SALAAM,
TANGANYIKA TERRITORY.

1st September, 1929.

SIR,

I have the honour to submit, for the information of His Excellency the Governor and for transmission to the Right Honourable the Secretary of State for the Colonies, the Medical Report on the health and sanitary condition of the Tanganyika Territory for the year 1928, together with the Returns, etc., appended thereto.

I have the honour to be,

Sir,

Your obedient Servant,

J. O. SHIRCORE,
*Director of Medical and Sanitary Services,
Tanganyika Territory.*

THE HONOURABLE
THE CHIEF SECRETARY TO THE GOVERNMENT,
DAR-ES-SALAAM.

CORRIGENDA TO THE TANGANYIKA TERRITORY ANNUAL MEDICAL AND SANITARY REPORT FOR THE YEAR 1928.

Corrigenda Page 10.

In 1928 column under Circulatory System alter	0·39	to	0·40
„ „ „ „ Respiratory „ „	42091	„	41091
In text „ „ „ „	7509	„	6509
In 1928 column „ Digestive „ „	77263	„	78363
„ „ „ „ „ „	18·07	„	19·32

Corrigenda Page 11.

In 1928 column “Burns by fire” alter	995	to	1095
„ „ „ “Burns (other than by fire)” „	234	„	243
„ „ „ Total „	34275	„	34375

Corrigenda Page 17.

In 1928 column, “Cases” alter	7509	to	6509
„ „ „ „ „ „	7200	„	8200
„ „ „ „ „ „	52018	„	52118
„ „ „ „ „ Total	405558	„	405658

The 1928 column of “Percentage to total number of cases treated” should read as follows:—

37·10
1·40
0·81
4·88
1·50
0·40
8·22
0·31
1·61
2·38
2·02
2·07
12·85
1·24
6·31
2·17

3·26
1·98
8·69
0·80

Corrigenda Page 19.

The figures on the graph of Total Incidence to be amended as indicated for the table on page 17.

Corrigenda Page 145.

In 1928 column “Out-patients” alter	372764	to	372864
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Under No. 178 “Burns by Fire”, column “Total Cases, In- and Out-patients”, alter 995 to 1095.

Under No. 189 “Injuries by Animals”, column “Total cases, In- and Out-patients”, alter 2064 to 1964; and 100 should be added accordingly to the Total and the Grand Total on page 267 making 405,658 and 526,242 respectively.

Corrigenda Pages 200 and 201.

Under No. 93 “Phlebitis”, column “Remaining”, insert 1.

Under No. 108 B “Other affections of the Mouth”, column “Out-patients”, alter 154 to 254.

Under No. 108 B “Other affections of the Mouth”, column “Total In- and Out-patients” alter 164 to 264.

Under No. 109 “Pharyngitis” column “Total Out-patients” alter 2882 to 1882.

Under No. 109 „ „ „ “Total Cases In- and Out-patients”, alter 2928 to 1928.

Under No. 114 “Two years and over” column “Total Out-patients” alter 2015 to 1015

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TANGANYIKA TERRITORY.

Annual Medical and Sanitary Report, 1928.

SECTION I.—ADMINISTRATION.

(a) Staff.

European :

Director of Medical and Sanitary Services.	26 Nursing Sisters.
Deputy Director of Medical Service.	2 Laboratory Assistants.
Deputy Director of Sanitary Service.	1 Chief Clerk.
Deputy Director of Laboratory Service.	2 Clerks.
4 Senior Medical Officers.	1 Storekeeper.
3 Senior Health Officers.	2 Assistant Storekeepers.
1 Sleeping Sickness Officer.	1 Hospital Quartermaster.
46 Medical Officers.	1 Medical Instructor.
2 Dental Surgeons.	1 Assistant Medical Instructor.
1 Assistant Bacteriologist.	1 Superintendent, Mental Hospital.
1 Entomologist.	1 Matron, Mental Hospital.
1 Analytical Chemist.	1 Building Inspector.
5 Senior Nursing Sisters.	1 Senior Sanitary Superintendent.
9 Sisters and Health Visitors.	16 Sanitary Superintendents.

Special Expenditure :

(For Kahama Maternity and Child Welfare Research.)

European :

Asiatic :

African :

1 Medical Officer.	4 Sub-Assistant Surgeons.	2 Motor Drivers.
2 Sisters and Health Visitors.		20 Ayahs.

Asiatic :

2 Assistant Surgeons.	1 1st Grade Clerk.
2 Senior Sub-Assistant Surgeons.	3 2nd Grade Clerks.
48 Sub-Assistant Surgeons.	12 3rd and 4th Grade Clerks.
36 Compounders.	3 Sanitary Inspectors.
1 Special Grade Clerk.	

African :

10 Clerks.	710 Hospital Orderlies, Nurses, Dressers and Menials.
54 Dispensers.	1,172 Sanitary Labourers.
202 Sanitary Inspectors.	
7 Vaccinators.	

APPOINTMENTS.

European :

Dr. H. H. B. Follit	to be a Senior Health Officer,	28th September.
Dr. A. V. Clemmey	to be a Medical Officer,	6th July.
Dr. J. B. C. Madge	do.	do.
Dr. D. E. Wilson	do.	do.
Dr. F. V. Adams	do.	11th October.
Dr. K. Edmundson	do.	10th November.
Mr. W. Whitley	to be an Analytical Chemist,	20th January.

APPOINTMENTS—*continued.**European*—continued.

Miss B. Eager to be a Sister and Health Visitor,	8th June.
Miss E. Neale	do. 21st June.
Miss C. Kemp	do. 16th August.
Miss M. L. E. Avant	do. 5th September.
Miss E. Ashberry	do. 13th September.
Miss M. B. Craig	do. do.
Miss A. A. Howorth	do. do.
Miss L. M. Bishop to be a Nursing Sister,	17th March.
Miss M. C. Ferguson	do. 21st June.
Miss J. Turnbull	do. do.
Miss M. H. MacDonald	do. 10th November.
Mr. H. D. Plevin to be a Laboratory Assistant,	11th October.
Mrs. F. G. Wilcocks to be a Temporary Medical Officer,	21st August.

Asiatic :

Mr. R. H. Joshi to be a Sub-Assistant Surgeon,	23rd February.
Mr. S. B. Tulpule	do. 28th March.
Mr. D. S. Mahabal	do. 11th April.
Mr. R. R. Joshi	do. 20th June.
Mr. C. L. Varma to be a Compounder,	26th March.
Mr. S. P. S. Gomes	do. 4th May.
Mr. Bahadur Singh	do. 21st May.
Mr. Nand Singh	do. 10th July.
Mr. J. F. de Souza to be a 4th Grade Clerk,	2nd April.
Mr. T. V. Abhyanker	do. do.
Mr. J. L. Nath	do. do.
Mr. A. Fernandes	do. 12th April.
Mr. A. da Cruz	do. 1st May.
Mr. Amar Singh	do. 11th June.
Mr. C. K. Shekharan	do. 18th June.
Mr. H. L. Victor	do. 29th September.

ACTING APPOINTMENTS.

European :

Dr. J. H. Parry, Acting Senior Medical Officer from	19th February to 19th November.
Dr. A. McA. Blackwood, Acting Senior Medical Officer from	1st January to 7th June.
Dr. A. I. Meek, Acting Senior Health Officer from	1st April to end of the year.
Dr. R. Mackay, Acting Senior Health Officer from	31st July to 8th December.
Miss M. Donald, Acting Matron from	26th August to end of year.
Mr. H. W. Hassard, Acting Medical Storekeeper from	24th June to 15th July.
Mr. C. N. Rowe, Acting Building Inspector from	6th September to end of year.
Mr. J. H. Stafford, Acting Medical Instructor from	1st April to end of year.

Asiatic :

Mr. J. de Souza, Acting Special Grade Clerk from	19th March to 23rd September.
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PROMOTIONS.

European :

Dr. J. H. Parry, Medical Officer, to be Senior Medical Officer,	20th November.
Dr. R. Nixon, Medical Officer, to be Senior Health Officer,	1st April.
Miss F. M. Plant, Senior Nursing Sister, to be Matron,	20th August.
Miss M. Donald, Nursing Sister to be a Senior Nursing Sister,	1st April.
Miss M. V. McIlroy, Nursing Sister, to be a Sister and Health Visitor,	29th August.

PROMOTIONS—*continued.**European*—continued.

- Mr. H. W. Hassard, Assistant Medical Storekeeper, to be Chief Medical Storekeeper, 17th July.
 Mr. C. N. Rowe, Sanitary Superintendent, to be Senior Sanitary Superintendent, 1st April.

Asiatic :

- Mr. B. G. Pandit, Senior Sub-Assistant Surgeon, to be an Assistant Surgeon, 1st January.
 Mr. Y. L. Moole, Sub-Assistant Surgeon, to be a Senior Sub-Assistant Surgeon, 1st January.
 Mr. Epie C. Rebello, 4th Grade, to be a 3rd Grade Clerk, 11th June.

RETIREMENTS.

- Dr. C. R. H. Tichborne, Medical Officer, 29th August.

AGREEMENTS EXPIRED.

- Dr. P. van R. Mostert, Medical Officer, 19th August.
 Dr. D. Plum do. 29th October.
 Miss J. E. Wootten, Nursing Sister, 19th June.
 Miss M. D. White, do. 21st April.

AGREEMENTS TERMINATED.

- Mrs. T. G. Jones, Temporary Sister and Health Visitor, 30th September.
 Mr. Diwan Singh, Sub-Assistant Surgeon, 2nd June.

RESIGNATIONS.

Nil.

DEATHS.

- Dr. J. H. Thomson, Senior Medical Officer, 19th November (while on leave in England).
 Mr. C. D. Dovey, Chief Medical Storekeeper, 16th July (at sea, while proceeding on leave).
 Mr. Saluzinho de Souza, 1st Grade Sanitary Inspector, 2nd February.
 Mr. Sayed Mahmood, Compounder, 17th June.

INVALIDINGS.

- Miss M. C. L. Mapp, Nursing Sister, 16th December.
 Mr. R. E. Owen, Sanitary Superintendent, 2nd September.

(b) List of Ordinances affecting Public Health enacted during the Year.

Government Notice No. 172 under Customs Ordinance, 1922 (No. 3 of 1922). This Regulation gives power to prohibit the importation of distilling apparatus and machinery unless a permit is given by the Chief Secretary to the Government : prevents importation of rat virus except as provided ; prohibits second-hand clothing, blankets and similar articles being imported for sale unless evidence of disinfection is produced at the time of import to the satisfaction of the Director of Medical and Sanitary Services.

(1) Ordinance No. 6 of 1928. An Ordinance to provide for the establishment and management of markets.

Gives power to establish markets, regulate their use and maintain cleanliness: to prescribe the goods that shall be sold, days and hours of sale, weights and scales, and provide for the examination of produce of articles of food.

(2) Ordinance No. 9 of 1928. An Ordinance to make further and better provision for the regulation of the importation, exportation, production, manufacture, sale and use of Opium and of certain other dangerous drugs and substances.

(3) Ordinance No. 13 of 1928. An Ordinance to provide for the control and management of Public Recreation Grounds.

(4) Ordinance No. 24 of 1928. An Ordinance to amend the Law relating to Masters and Native Servants.

Requires that Labour Agents obtain permits from the Labour Commissioner before they may recruit. Provides for medical examination of labour, and empowers an employer to fine for nuisances committed on estates or for non-attendance at a hospital or dispensary when directed to attend.

(5) Ordinance No. 33 of 1928. An Ordinance to provide for the Punishment of Witchcraft and of certain acts connected therewith.

(c) Financial.

Revenue ...	...	...	...	...	...	...	£ 10,440
Expenditure ...	...	...	...	...	...	...	227,018

II.—PUBLIC HEALTH.

(a) General Remarks.

This is the ninth Annual Medical and Sanitary Report of the Tanganyika Territory, and although a further increase of the non-native population, both unofficial and official, has taken place, the sick, invaliding and death rates, as may be seen by reference to Tables I and II, compare favourably with the returns for previous years. There has been substantial expansion of the following units :—

Maternity and Child Welfare Clinics.
African Dispensers.
African District Sanitary Inspectors.
Tribal Dressers.

Maternity and Child Welfare.—In the 1927 estimates 4 fully qualified Health Visitors were provided for, they were increased to 9 during 1928.

Infant and Maternal Mortality is high, and great extension of the system of welfare clinics must be undertaken before an appreciable increase of population may be anticipated.

African Dispensers.—Twelve pupils remained over from last year. During the year 42 were admitted for training, of which 30 were drafted to the Tabora hospital for clinical study, 3 were employed in Dar-es-Salaam and 9 remained at the end of the year.

The total number of African Dispensers, including those engaged before the School was opened, was 64. The process of training is a slow one and it will be several years before the full complement of 250 will materialise.

African District Sanitary Inspectors.—This organisation consists of 185 Sanitary Inspectors.

The cost at present per annum, not including uniforms and equipment, is £6,660. Apart from the general sanitary and educative influence on the mass of the population, its value may be estimated from two interesting examples, which, had they not been brought to light at an early stage, might have cost the Government a much larger sum than the amount expended. The first example was a small outbreak of Bubonic Plague near

Image on the Iringa-Kilosa road, about 25 miles from Iringa. The occurrence was reported immediately by the Sanitary Inspector to the Medical Officer at Iringa and was promptly dealt with, see page 201 for details.

The second and more important example of the two was the incidence of Bubonic Plague, no more than 12 miles from Manyoni, a station on the Central Railway. The Sanitary Inspector of the area reported the incidence of a mortality amongst the rats at a village near the River Kisigo, that two people had died, and two others were suffering from a disease showing severe symptoms, accompanied by fever and glandular enlargement, which he considered was plague. Steps were taken without delay, the diagnosis confirmed and no further cases occurred—for further information see page 30. It is clear from the above that the African District Sanitary Inspector fulfils an essential function, and forms an important and valuable intelligence liaison, between the endemic and epidemic fields in the districts and the central administration, which could not be attained, with certainty or regularity, in any other way.

Tribal Dressers.—During 1927 ninety dressers had completed their training and were at work at their dispensaries. This number was increased to 147 in 1928, and provision for 100 more has been made in the Tribal Authorities estimates for 1929-30. When the formation of this unit was under consideration some three years ago, it was suggested that its ratio to the population should be 1 per 5,000, *i.e.*, that there should be maintained permanently for the whole Territory not less than 1,000 Tribal Dressers. It is therefore satisfactory to note that in a little over two years a quarter of the full complement has been established.

In the Bukoba Province the Tribal Authorities have actually paid for the services of a fully qualified Indian Sub-Assistant Surgeon, for purposes of supervision over the Tribal Dressers, and have provided in some places small hospitals of 2 to 6 beds, to meet emergencies. In a country in which, at the present date, the majority of the population is situated beyond the effective radius of the regular medical service, where minor ailments and more serious injuries, incidental to accidents, wounds produced by weapons and powerful wild animals, which, if unattended early are prolific sources of morbidity and mortality, the scope of the dispensaries as a means of affording relief and saving life cannot be over-estimated.

(1) GENERAL DISEASES.

Eighty-six cases of malignant diseases were recorded as compared with 69 for the previous year. For the anatomical distribution see page 257, numbers 43-49 of Tables V and VI.

Deficiency Diseases.—There were 552 cases of scurvy and 37 of beri-beri. As stated in previous reports the responsibility lies chiefly with the contractors, who supply deteriorated foodstuffs, rather than the employer of labour. It is not an easy matter to deal with, because of the difficulty in obtaining fresh supplies at short notice, indeed, it is frequently quite impossible to do so.

With the exception of a small outbreak of scurvy at the Dodoma Jail, due to similar causes, the health of the prisoners has been good.

	1924.	1925.	1926.	1927.	1928.
Number of deaths	76	59	60	34	49
Daily average number of prisoners during the year	1,736·60	1,760·12	1,858·80	1,848·04	1,826·5
Total number of prisoners during year ..	9,947	9,091	8,460	7,710	7,373
Percentage of deaths to average number of prisoners	4·31	3·30	3·22	1·78	2·68
Percentage of deaths to total number of prisoners	0·76	0·65	0·70	0·44	0·66

In view of the general low “ vitamin ” potential of the African diet, and with the object of providing, as far as possible, on an extensive scale a unit of high “ vitamin ” efficiency

funds were allocated, from the Medical vote, to the Director of Agriculture, who has very kindly arranged for the distribution of tomato seeds to the district population, through the members of the administrative, agricultural and medical departments. It is hoped that by enlisting the services of the native authorities, tribal dressers, African dispensers and district sanitary inspectors, the cultivation of the tomato will become established throughout the territory. Owing to the ravages of the Tsetse fly enormous areas of the country cannot support cattle and as a consequence a large percentage of the population suffer from deficiency of fat, fat soluble "A" and "D," unsurmountable at present, facts which should be borne in mind with a view to future relief.

<i>Nervous and Mental Diseases.</i> —						1926.	1927.	1928.
Cases	..	..	..	..	..	4,035	3,298	3,285

There were 10 cases of locomotor ataxia, 97 of various forms of paralysis, 3 of general paralysis of the insane, 111 of other forms of mental alienation, and 218 of epilepsy.

<i>Diseases of the Circulatory System.</i> —						1926.	1927.	1928.
Cases	..	..	..	..	..	1,383	1,349	1,591
Deaths	..	..	..	..	..	15	15	18
Percentage of cases to total cases	..	..	..	..	..	0.41	0.34	0.39
Percentage of deaths to total deaths	..	..	..	..	..	2.20	1.62	1.46

<i>Diseases of the Respiratory System.</i> —						1926.	1927.	1928.
Cases	..	..	..	..	..	38,881	40,281	42,091
Deaths	..	..	..	..	..	148	149	218

Acute and chronic bronchitis showed 33,318 cases, with three deaths, lobar and broncho-pneumonia 1,264, with 186 deaths, and other diseases of the respiratory system 7,509, with 29 deaths. The above group comprise 10.38 per cent. of the total annual returns of diseases.

<i>Lobar and Broncho-pneumonia.</i> —						1926.	1927.	1928.
Cases	..	..	..	..	..	741	855	1,264
Deaths	..	..	..	..	..	126	125	186
Percentage of cases to total cases	..	..	..	..	..	0.22	0.21	0.31
Percentage of deaths to total deaths	..	..	..	..	..	13.56	12.60	15.08

<i>Diseases of the Digestive System.</i> —						1926.	1927.	1928.
Cases	..	..	..	..	..	53,762	66,475	77,263
Deaths	..	..	..	..	..	220	250	308
Percentage of cases to total cases	..	..	..	..	..	16.10	17.76	18.07
Percentage of deaths to total deaths	..	..	..	..	..	23.68	25.20	24.99

<i>Ankylostomiasis.</i> —						1926.	1927.	1928.
Cases	..	..	..	..	..	4,632	5,078	26,804

Although our supplies of carbon tetrachloride and oil of chenopodium capsules were not received till late in the year and were ultimately distributed during September, the progress made might be regarded as satisfactory.

<i>Schistosomiasis.</i> —						1926.	1927.	1928.
Cases	..	..	..	..	..	1,052	1,288	1,938

This disease is widespread, and of importance as a cause of ill-health, fortunately it does not in this territory result in the gross pathological lesions, except in areas of intense infectivity, found in other parts of Africa. Its distribution makes it difficult to devise preventive methods that may be depended upon to prove effective.

<i>Diseases of the Skin and Cellular Tissue.</i> —						1926.	1927.	1928.
Cases	..	..	..	..	..	46,692	47,885	47,586
Deaths	..	..	..	..	..	49	55	72

It is clear from the above remarks and a perusal of the table on page 17 of this report, that organic disease forms a very small proportion of the diseases which attack the African, and that preventive medicine and hygiene should be developed to their utmost economic limits.

Affections Produced by External Causes.—

Cases—	1927.	1928.
Burns (by fire)	1,807	995
Burns (other than by fire)	227	234
Wounds (by cutting or stabbing instruments) ..	6,426	8,455
Wounds (by fall)	8,894	6,695
Wounds (in mines and quarries)	817	154
Wounds (by machinery)	1,322	691
Wounds (crushing, <i>e.g.</i> , railway accidents, etc.) ..	536	157
A.—Dislocations	53	100
B.—Sprains	996	1,372
C.—Fractures	367	414
Other injuries	12,746	13,371
Other affections produced by local causes	2,587	1,628
	<hr/> 36,778	<hr/> 34,275
	1927.	1928.
Cases	36,778	34,275
Deaths	97	96

(2) COMMUNICABLE DISEASES.

Anthrax.—A total of seven cases were reported which is an unusually low incidence. This disease occurs in mild form and is due chiefly to the ingestion of diseased meat. It is likely that cases have been diverted to the tribal dressing stations, of which there are now several in the endemic areas, and have therefore not been recorded.

Acute Poliomyelitis.—One case was reported from Songea.

<i>Epidemic Cerebro-Spinal Meningitis.</i> —	1926.	1927.	1928.
Cases	14	8	9
Deaths	10	6	6
<i>Chickenpox.</i> —	1926.	1927.	1928.
Cases	560	449	381
Deaths	—	1	—

The majority of the cases occurred in the Central, Northern and Tabora Provinces and the distribution was practically the same as for previous years.

<i>Dengue.</i> —	1926.	1927.	1928.
Cases	71	21	10
Deaths	—	1	—

There were no cases at Dar-es-Salaam, only 4 at Tanga, 2 at Iringa, and 1 at Lindi, as compared with 5 during 1927.

<i>Diphtheria.</i> —	1926.	1927.	1928.
Cases	2	1	4
Deaths	2	—	—

Dar-es-Salaam and Iringa returned two cases each. The former were confirmed at the Bacteriological Laboratory.

Dysentery.—See the Deputy Director of Sanitary Service's Report on page 31.

	1926.	1927.	1928.
Amœbic	471	639	577
Bacillary	337	248	225
Unclassified or due to other causes ..	177	450	710

The areas that supplied the largest numbers of cases were Arusha 71, Dodoma 74, Kilosa 150, Morogoro 181, and Tanga 72. These are the main centres at which labour is employed. From a study of the returns under the digestive system, which includes Ankylostomiasis, it is evident that some more definite form of legislation, calculated directly to improve the sanitation on estates, than exists at present, must be promulgated before reduction of the increasing incidence of dysentery, other bowel conditions, and hookworm may be anticipated.

There were 67 deaths due to dysentery and 258 to diseases of the digestive system, which together amount to 26·3 per cent. of the total deaths returned from all hospitals.

	1927.	1928.
Deaths due to dysentery	35	67
Deaths due to diseases of the digestive system ..	250	258
Percentage of deaths to total number of deaths from all causes	25·2	26·3

Encephalitis Lethargica.—One case was reported from Iringa and five from Kondoa-Irangi. Deaths nil.

Malaria and Blackwater.—

Malaria—	1926.	1927.	1928.
Cases	29,856	29,673	33,731
Deaths	41	40	47

The increase over the two previous years is, roughly, 4,000 cases. From a distribution table in which the returns from the different stations are recorded, it is interesting to note that a definite reduction has taken place both as regards malaria and blackwater fever at Tabora and Tanga, the former of which was notorious in the past as an infective centre for both these diseases. The bulk of this increase refers to Dar-es-Salaam, and in view of the increased influx of population, early steps should be taken to establish an efficient sewerage and drainage system.

Blackwater Fever.—

	1926.	1927.	1928.
Cases	85	72	60
Deaths	19	16	14

There has been a definite improvement as regards blackwater fever.

Mumps.—

	1926.	1927.	1928.
Cases	44	115	78

Plague.—See the Deputy-Director of Sanitary Service's report on page 30.

Rat-Bite Fever.—One case occurred due to a bite from an experimental rat at the Bacteriological Laboratory.

Relapsing Fever.—See the Deputy-Director of Sanitary Service's report on page 30.

	1926.	1927.	1928.
Cases	227	273	312
Deaths	6	5	1

Smallpox and Vaccination.—See the Deputy-Director of Sanitary Service's report on page 30.

The number of cases of smallpox for the three years 1926–1928, inclusive, is as follows :—

	1926.	1927.	1928.
Cases	22	84	26

The total of vaccinations performed during 1928 were 304,074.

Trypanosomiasis.—See the Sleeping Sickness Officer's report on page 170.

The situation in the old foci in the Mwanza, Ufipa, South Tabora, and Liwale areas has improved.

The recruiting of labour from these areas is, however, still prohibited. The opening up of the region to the north-east of Musoma for recruiting is under consideration.

In the Kahama and North Tabora areas, which had been under suspicion for some time, sleeping sickness has assumed epidemic activity. Energetic measures have been taken, and there can be little doubt but that similar results will be achieved in this zone as have been elsewhere. From the results of treatment, with Bayer "205," of the members of the medical staff who have acquired the disease during the course of their duties, it seems clear that, provided the case is diagnosed early, recovery is certain.

Tuberculosis.—See also table showing incidence of tuberculosis, on page 35.

The total number of in- and out-patients treated at the various hospitals, including those returned from the Kibongoto Tuberculosis Settlement and the Moshi-Pare area, are shown below :—

<i>Total Cases and Deaths for the Territory.</i> —						1926.	1927.	1928.
Cases	..	..	..	..	..	444	888	1,172
Deaths	..	..	..	..	..	81	72	110

It is important to note in this connection, from records kept by Dr. Ievers, that 150 cases were diagnosed and confirmed, either by sputum examination or post-mortem, at the Tanga Hospital. The Tanga district is co-continuous with the Moshi-Pare area, which together form a large proportion of the Northern Province.

Moshi-Pare Area.—Returns from the Kibongoto Settlement for 1928 :—

Remained from 1927	..	..	..	..	..	..	14
Admitted during 1928	..	..	..	..	..	..	101
Died	..	..	..	..	..	..	6*
Total treated	..	..	..	..	..	..	115
Remaining	..	..	..	..	..	..	25

New cases admitted to Kibongoto and Usangi Tuberculosis Settlements :—

				Kibongoto.		Usangi.	
				1927.	1928.	1927.	1928.
Cases	..	..	..	51	101	—	5

Moshi-Pare District Tuberculosis Survey.—

1927—Moshi-Pare area.	New cases	..	..	..	..	..	231
1928—Moshi area	..	..	..	..	..	..	358
Pare area	..	..	..	..	..	..	240

The figures shown immediately above include the admissions to the settlements.

In the Annual Medical Report for 1924 I stated as follows :—

“ The position as regards tuberculosis is disquieting. What the situation is it is not possible to say, but . . . it is clear that there has been an increase within the last few years, and the total suffering from all forms was 333 with 70 deaths, as compared with 202 with 34. With increase of staff we are getting more closely in touch with diseases of all varieties, but the persistency with which certain of our bigger centres return uniformly large numbers of cases indicates permanent foci, and Moshi has consistently shown itself to be heavily infected. Dar-es-Salaam is a cosmopolitan area, and 22 cases for a large town is not out of the way, nor, perhaps, of 18 for Tabora and 16 for Mwanza. The situation as regards Moshi and Pangani are different. The largest tribe in the vicinity of Moshi is the Chagga, and the climate in the slopes of Kilimanjaro, chiefly occupied by these people, is bleak and cold for most of the year, which naturally conduces to overcrowding in ill-ventilated, confined, over-heated huts. The difficulties in overcoming these tendencies are almost insurmountable at the present. The only way that holds out hope, and which it is proposed to put into execution, is to appoint a district Medical Officer for the purpose of getting into touch with the natives, carefully studying the question locally, and, if possible, obtaining a tuberculosis census. His services, combined with the improvement of general district hygiene, for which a staff of African district sanitary inspectors will be in the process of training next year, and the introduction of a sanatorium system suitably situated and modelled on the plan of a native village, might possibly bring about segregation by moral suasion. The surroundings could be made pleasant, the patients' families might be allowed to live with them, those who were fit enough could be given facilities for plying their various trades ; food, medical aid, and particularly supervision would be provided.

“ It must, however, be borne in mind that the combination of the psychology of the chronic phthisical patient with the natural dislike of the home-loving native to be away from his friends and surroundings are obstacles which might take years to overcome, before the benefits of sanatorium treatment and a hygienic environment can be appreciated.”

* So far as can be ascertained; including deaths, reported to have occurred after the patients left the settlement, the total deaths for the Moshi-Pare area was 13.

It was not, however, until 1927 that it was found possible to detail a Medical Officer for special investigation in the Moshi-Pare area, which I had come to regard as an endemic focus of the disease. Dr. Davies, who was the officer chosen for the purpose, assumed his duties during 1927, and the work done by him for the past two years demonstrates that tuberculosis, as we suspected, is widely distributed amongst the population of the area mentioned. According to the Hon. Charles Dundas, who was for some years in administrative charge of the Moshi district, the Wachagga, as a tribe, arose some 400 years ago, from the Akamba, whose original home lay on the north-east of the Kilimanjaro massif. From this centre they spread west to Mount Meru and south-east to the Pare mountains.

The northern aspect of Kilimanjaro is dry and uninhabited, whereas a strip, lying between 4,500-6,000 feet above sea level, running along the eastern, southern and western sides of the mountain, a region of moderately heavy rainfall, forms what might be called the tuberculosis-bearing belt. The natives live generally in ill-ventilated huts, which are so arranged that their domestic animals, including cows, are also accommodated within the habitations. The cows are entirely stall-fed and, except when they have increased in numbers which are too numerous to keep in the original hut and are being transferred to the huts of neighbours, sometimes at a distance away, never see the light of day. Should bovine tuberculosis exist, the significance of transferring infected cattle to clear areas is a matter of importance. The cattle have in the process of time grown into a distinct breed of stunted animals, and, due to living in the absence of light, are frequently blind.

There is apparently no lack of food amongst the population of this fertile zone. So far as known, the same conditions hold true for Pare, and it would be interesting to ascertain whether Mount Meru, which climatically is also the same, is an endemic centre. We propose that the whole of this area, and possibly other areas, where similar climatic conditions prevail, shall be surveyed when Dr. Davies, who is due for leave, returns to the Territory.

It is stated by the Veterinary Department that there is no bovine tuberculosis at Moshi, on the other hand, Dr. Davies has found an appreciable number of glandular cases. Hitherto, it was thought that tuberculosis, in Eastern Africa, was confined mostly to towns and the coastal regions. The idea being that at those places, the native was more in touch with infection from other sources, namely, immigrant tubercle carriers, and that the indigenous population was practically tuberculosis free. But here we have the Wachagga and the Wapare, at a considerable distance from the coast, isolated from any recent reservoir of infection, living in the midst of a wide infective field. Dr. Davies finds a history of tuberculosis passing through several generations. It cannot hardly be questioned that a total of 894 cases discovered under difficult conditions for investigation, in less than two years, at numerous villages throughout the districts investigated, is a definite indication of a long-established nidus of infection.

That tuberculosis might have been amongst the Wachagga for centuries, as an original disease, or acquired through contact with Arab slave-traders during the last century or two, is now hardly possible to establish, but the numbers and widespread distribution of the cases would seem to preclude the probability of recent introduction.

See also Dr. Davies' report on page 216.

Yaws and Syphilis.—The year 1928 completes five years of intensive work against yaws and syphilis, and whilst a comparison of the tables given in the various Annual Medical Reports for the territory for the years referred to, show that there is some decrease of cases at several of the treatment centres, when the figures are compared year by year by districts, no striking decrease becomes apparent in any one area. This is accounted for, in my opinion, by the opening up of fresh treatment centres and by the extension of field work undertaken by both missionary and Government medical staff.

During 1927 there were 54 Government and 19 mission treatment centres; during 1928 these increased to 57 and 31 respectively.

The following table shows the total numbers dealt with during 1928.

STATION.				YAWS	SYPHILIS.	STATION.				YAWS.	SYPHILIS.
						Brought forward				78,471	9,817
ARUSHA	..	..	..	2,581	185	MAHENGE	..	..	..	6,395	19
Kibaya	..	..	..	296	85	" District	..	..	..	2,151	—
Mbulu	..	..	..	128	85	*Ifakara	..	..	..	2,786	—
BAGAMOYO	..	..	..	5,915	387	*Sofi	..	..	..	639	—
" District	..	..	..	5,028	—	MOROGORO	..	..	..	886	302
BUKOB	..	..	..	1,219	2,256	Kilosa	..	..	..	1,698	285
Biharamulo	..	..	..	3,465	687	Kisaki	..	..	..	541	325
DAR-ES-SALAAM	..	..	..	5,487	109	*Matombo	..	..	..	302	—
*Minaki	..	..	..	830	16	*Mhonda	..	..	..	267	—
Mafia	..	..	..	552	113	†Ngerengere	..	..	..	708	—
Utete	..	..	..	7,377	4	MOSHI	..	..	..	1,608	113
DODOMA	..	..	..	88	120	MWANZA	..	..	..	2,132	3,694
*Kongwa	..	..	..	1	1	Maswa	..	..	..	57	177
*Kilimatinde	..	..	..	1	1	Malampaka	..	..	..	128	—
Manyoni	..	..	..	24	31	Musoma	..	..	..	1,262	563
Mpwapwa	..	..	..	148	22	NAMANYERE	..	..	..	57	60
Singida	..	..	..	406	55	PANGANI	..	..	..	668	47
IRINGA	..	..	..	181	51	Handeni	..	..	..	42	30
Malangali	..	..	..	43	—	SONGEA	..	..	..	1,185	133
Njombe	..	..	..	252	32	TABORA	..	..	..	1,183	1,167
*Tosamaganga	..	..	..	—	8	*Ipole	..	..	..	3	46
KASANGA	..	..	..	457	232	Kahama	..	..	..	370	253
*Karema	..	..	..	172	108	" District	..	..	..	6,750	1,986
KIGOMA	..	..	..	4,667	182	*Lububu	..	..	..	8	19
Kasulo	..	..	..	3,709	1,029	Nzega	..	..	..	921	484
Kibondo	..	..	..	4,606	983	Runzewe	..	..	..	319	61
Ujiji	..	..	..	1,143	265	*Sekonge	..	..	..	36	267
KILWA	..	..	..	2,564	616	Shinyanga	..	..	..	1,061	1,491
Kibata	..	..	..	923	805	*Usoke	..	..	..	410	1,330
Liwale	..	..	..	544	5	TANGA	..	..	..	1,232	314
" Sl. Sick. Area	..	..	..	230	4	*Bombwera	..	..	..	550	56
KONDOA-IRANGI	..	..	..	1,328	164	*Gomba Sisal Estate	..	..	..	27	14
Mkalama	..	..	..	2,955	72	*Kingoi	..	..	..	377	60
LINDI	..	..	..	2,260	33	*Korogwe	..	..	..	608	1,670
*Luatala	..	..	..	513	—	*Kwa Mkowa	..	..	..	61	97
*Lulindi	..	..	..	4,155	52	*Mkuzi	..	..	..	1,184	94
*Masasi	..	..	..	588	72	*Msalabani	..	..	..	1,098	128
Mikindani	..	..	..	6,509	771	*Mkuyomi	..	..	..	—	79
*Ndanda	..	..	..	2,135	—	*Misozwe	..	..	..	4	—
*Namagono	..	..	..	96	—	*Tongwe	..	..	..	168	2
Newala	..	..	..	3,717	131	TUKUYU	..	..	..	370	75
*Saidi Mambo	..	..	..	524	1	*Itete	..	..	..	11	2
Tunduru	..	..	..	612	12	*Ilembula	..	..	..	51	19
LUSHOTO	..	..	..	42	32	Mbeya	..	..	..	61	26
						*Mwakelele	..	..	..	10	1
						Mwaya	..	..	..	8,935	119
Carried forward	..			78,471	9,817	TOTAL	..	..		127,791	25,425

* Cases treated by the Staff of Medical Missions.

† Cases treated by Sub-Assistant Surgeon employed by the Rosehaugh Company.

We are indebted to the undermentioned missions for work undertaken on our behalf with drugs and equipment supplied by the medical department.

As may be seen from the table, nearly 10 per cent. of the cases of yaws and syphilis are treated by missionary organisations.

Missions.				Yaws.	Syphilis.
Universities Mission to Central Africa—					
Dar-es-Salaam Area	..	..	..	830	16
Lindi	..	..	..	9,505	275
Tanga	..	..	..	4,173	2,200
Church Missionary Society—					
Dodoma	..	..	..	2	2

Missions— <i>continued</i> .							Yaws.	Syphilis.
Berlin Mission—								
Tukuyu	..	..	..	..	..	..	21	3
Moravian Mission—								
Tabora	..	..	..	..	..	..	500	1,662
Holy Ghost Fathers—								
Morogoro	..	..	..	..	..	..	569	—
The White Fathers—								
Karema	..	..	..	..	..	..	172	108
Capuchin Fathers—								
Mahenge	..	..	..	..	..	..	3,425	—
Swiss Benedictine Fathers—								
Lindi	..	..	..	..	..	..	2,135	—
Italian Fathers of the Consolata—								
Iringa	..	..	..	..	..	..	—	8
							<hr/> 21,332	<hr/> 4,274

During the past five years 442,411 cases of yaws have been treated in the territory, the totals, by years and provinces, are tabulated below.

Figures for the five years 1924–1928 :—

							Yaws.	Syphilis.
1924	..	..	..	..	..	..	20,750	4,348
1925	..	..	..	..	..	..	75,689	11,829
1926	..	..	..	..	..	..	97,807	17,483
1927	..	..	..	..	..	..	120,374	20,810
1928	..	..	..	..	..	..	127,791	25,425
Totals	..	..	..	..	..	..	<hr/>442,411	<hr/> 79,895

The total numbers and percentages of yaws treated during the five years 1924–1928, by provinces :—

								Per cent.
Bukoba	..	..	..	..	..	..	19,229	4·34
Central	..	..	..	..	..	..	29,619	6·70
Eastern	..	..	..	..	..	..	111,619	25·23
Iringa	..	..	..	..	..	..	35,190	7·92
Kigoma	..	..	..	..	..	..	29,882	6·80
Lindi	..	..	..	..	..	..	92,690	20·90
Mahenge	..	..	..	..	..	..	32,014	7·23
Mwanza	..	..	..	..	..	..	14,036	3·20
Northern	..	..	..	..	..	..	22,953	5·20
Tabora	..	..	..	..	..	..	31,548	7·14
Tanga	..	..	..	..	..	..	23,631	5·34
Totals	..	..	..	..	..	..	<hr/>442,411	<hr/> 100·00

Although the treatment of yaws and syphilis with bismuth sodium tartrate has proved an inestimable boon to the African, it has been the intention of the writer to displace bismuth sodium tartrate, which possesses certain disadvantages, one of which is the occurrence of pain on injection, by bismuth arsanilate, a more efficient preparation, which is less toxic, produces little local reaction and no stomatitis. Several cases have now been treated by Dr. Connell and Dr. Langan at the Sewa Hadji Hospital, with bismuth arsanilate, prepared by Martindale, and sent out suspended in oil in capsules. This preparation is excellent for individual cases, but for mass treatment it is proposed to use a suspension of bismuth arsanilate in water.

At the writer's request, Martindale is sending out a consignment for trial under field conditions, which, if found satisfactory in practice, will be put into general use throughout the territory.

Dr. Connell's note may be referred to on page 206 of this report, and holds out hope that bismuth arsanilate will not only reduce the mass infectivity of yaws, but will in a few doses produce a permanent cure and a negative serum reaction.

For further information regarding the value of bismuth arsanilate reference should be made to (a) "Yaws and Syphilis in Tropical Africa," "Lancet," 3rd July, 1926 ; (b) "British Journal of Venereal Diseases," Vol. IV, No. 1, pages 38–42.

TABLE SHOWING TOTAL CASES, PERCENTAGES OF GROUPS TO TOTAL CASES TREATED, DEATHS AND PERCENTAGE OF DEATHS TO TOTAL NUMBER OF DEATHS.

	Cases.			Deaths.			Percentage to total number of cases treated.			Percentage of deaths to total number of deaths.		
	1926.	1927.	1928.	1926.	1927.	1928.	1926.	1927.	1928.	1926.	1927.	1928.
Epidemic, endemic and infectious diseases	134,712	159,091	150,500	298	256	334	40.30	40.12	37.11	32.07	25.81	27.08
General diseases	3,539	5,183	5,731	52	59	51	1.06	1.31	1.40	5.59	5.95	4.14
Diseases of the nervous system	4,035	3,298	3,285	22	34	43	1.21	0.83	0.81	2.40	3.43	3.49
" " organs of vision	12,155	15,936	19,789	3	1	1	3.64	4.02	4.89	0.32	0.10	0.08
" " ear and mastoid sinus	4,296	4,932	6,023	—	1	1	1.21	1.24	1.50	—	0.10	0.08
" " circulatory system	1,383	1,349	1,591	15	15	18	0.41	0.34	0.04	1.62	1.51	1.46
Acute and chronic bronchitis	34,890	34,692	33,318	11	10	3	10.43	8.75	8.22	1.18	1.01	0.24
Lobar and broncho-pneumonia	741	855	1,264	126	125	186	0.22	0.21	0.31	13.56	12.60	15.08
Other diseases of the respiratory system	3,250	4,734	7,509	11	14	29	0.97	1.19	1.85	1.18	1.41	2.35
Caries and pyorrhœa	5,199	8,350	9,635	—	—	1	1.55	2.10	2.40	—	—	0.08
Diarrhœa and enteritis	5,664	8,407	7,200	29	79	57	1.70	2.12	1.80	3.12	7.96	4.62
Ankylostomiasis	4,632	5,078	8,410	157	121	202	1.40	1.28	2.04	16.90	12.20	16.39
Other diseases of the digestive system	38,267	44,640	52,018	34	50	48	11.45	11.26	12.83	3.66	5.04	3.90
Diseases of the genito-urinary system	3,423	4,150	5,137	30	34	26	1.02	1.05	1.30	3.22	3.43	2.11
Ulcers	21,652	16,303	25,574	21	25	23	6.48	4.11	6.31	2.25	2.52	1.87
Scabies	9,271	11,449	8,799	1	—	—	2.80	2.90	2.20	0.10	—	—
Other diseases of the skin and cellular tissue	14,769	20,133	13,213	27	30	49	4.42	5.07	3.26	2.90	3.02	3.98
Diseases of bones and organs of locomotion	6,890	7,739	8,056	4	5	4	2.10	1.95	2.23	0.43	0.50	0.32
Affections produced by external causes	19,619	36,778	35,275	56	96	95	5.87	9.28	8.70	6.06	9.68	7.70
Ill-defined and other diseases	5,868	3,473	3,231	32	37	62	1.76	0.87	0.80	3.44	3.73	5.03
	334,255	396,570	405,558	929	992	1,233	100.00	100.00	100.00	100.00	100.00	100.00

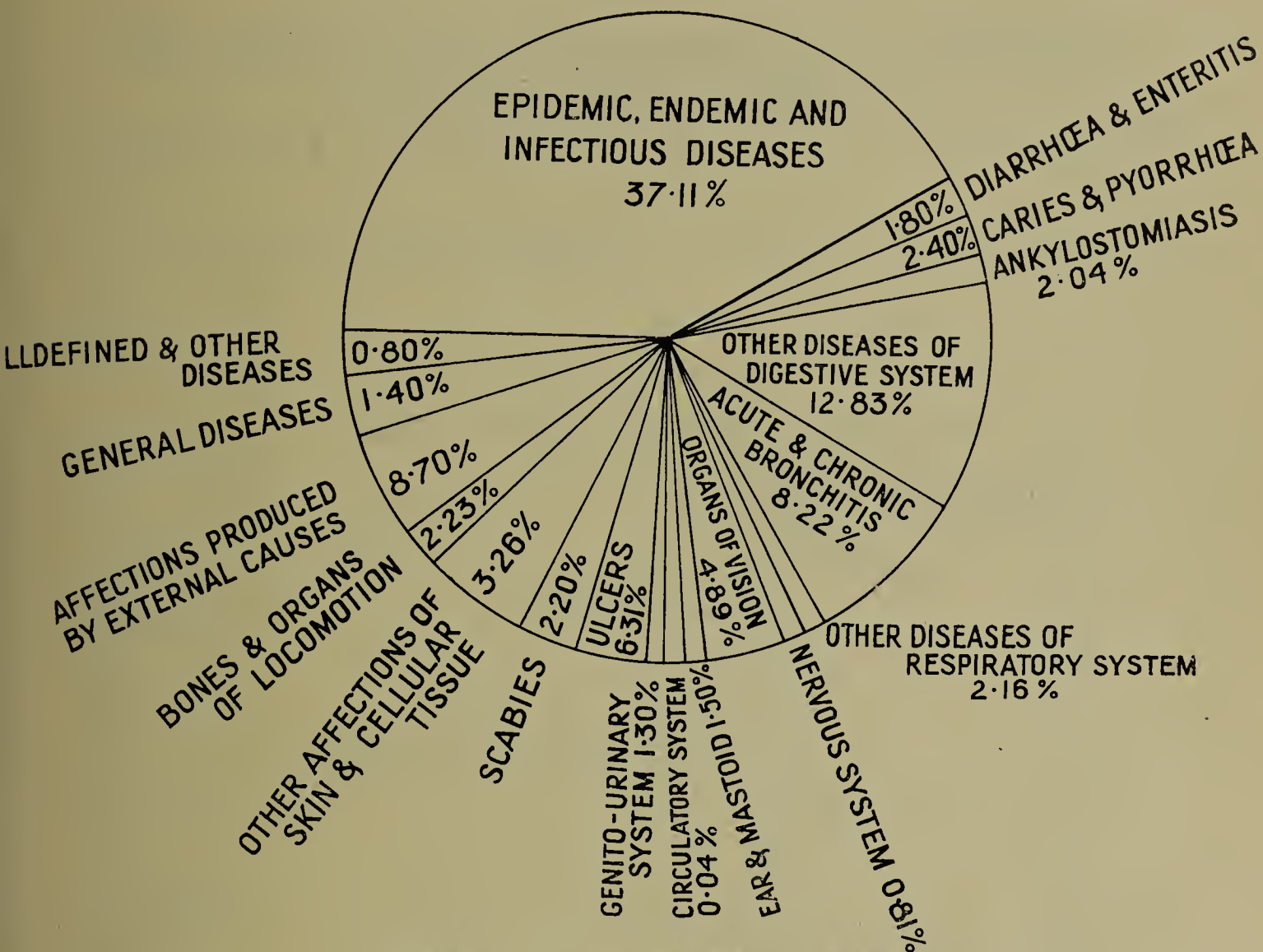
SURGICAL OPERATIONS PERFORMED DURING 1928. THE FIGURES REPRESENT THE
NUMBER OF OPERATIONS CONDUCTED WITH OR WITHOUT GENERAL ANÆSTHETIC.

BONES, OPERATION :		Brought forward	993
Fractures, simple	60	AMPUTATIONS :	
" compound	27	Hand	12
Osteotomy	2	Arm	12
Resection	10	Leg	14
Others (unclassified)	17	Foot	2
		Digits	50
CHEST, OPERATIONS ON :		Thigh	1
Breast abscess, incision of	3	Unclassified	5
Thoracotomy	17	JOINTS, OPERATION ON :	
LAPAROTOMY :		Reduction of dislocation	20
Abdomen, penetrating wound of ..	3	Others (including unclassified) ..	17
Abscess of liver, laparotomy-		MUSCLES AND TENDONS, OPERATIONS	
hepatotomy	8	ON	5
" " aspiration	2	Tenotomy	2
Appendectomy with local peritonitis	6	RECTUM, OPERATIONS ON :	
Appendix abscess	7	External hæmorrhoids	11
Exploratory	5	Fistula in ano	7
Fibroids	3	MISCELLANEOUS :	
Ovarian cystectomy	1	Abscess, treatment of	559
Paracentesis abdominalis	5	Cysts	9
Others (including unclassified) ..	6	Elephantiasis, treatment of	98
OBSTETRICAL :		Fistulous tracts	3
Abortion	1	Neoplasms, excision of, benign ..	76
Births, forceps operations	23	" " malignant	18
" abdominal presentations ..	6	Removal of foreign body	7
Repairs of perineum	2	Skin graft	37
Others (including unclassified) ..	20	Thyroidectomy	3
GENITO-URINARY TRACT :		Tooth extractions	594
Circumcisions	193	Ulcers, treatment of	45
Curettage uteri	9	Wounds, gunshot	7
Hæmatocele	12	" others	569
Hydrocele, single, radical cure ..	242	Various other minor operations ..	949
" double, radical cure	19	Others (including unclassified) ..	642
Orchidectomy	9	EAR, OPERATIONS ON :	
Superpubic cystotomy	10	Mastoid operations	7
Urethrotomy, external	5	EYE, OPERATIONS ON :	
Others (including unclassified) ..	44	Cataract, extraction of	31
HERNIOTOMY :		Enucleation	7
Inguinal, single	200	Lid—operations	5
Femoral	1	Others (including unclassified) ..	1
Strangulated	9	NOSE AND THROAT, OPERATIONS ON :	
Others (including unclassified) ..	3	Tonsillectomy	2
ADENECTOMY :		Others (including unclassified) ..	202
Cervical	2		
Others (including unclassified) ..	1		
Carried forward	993	TOTAL	5,022

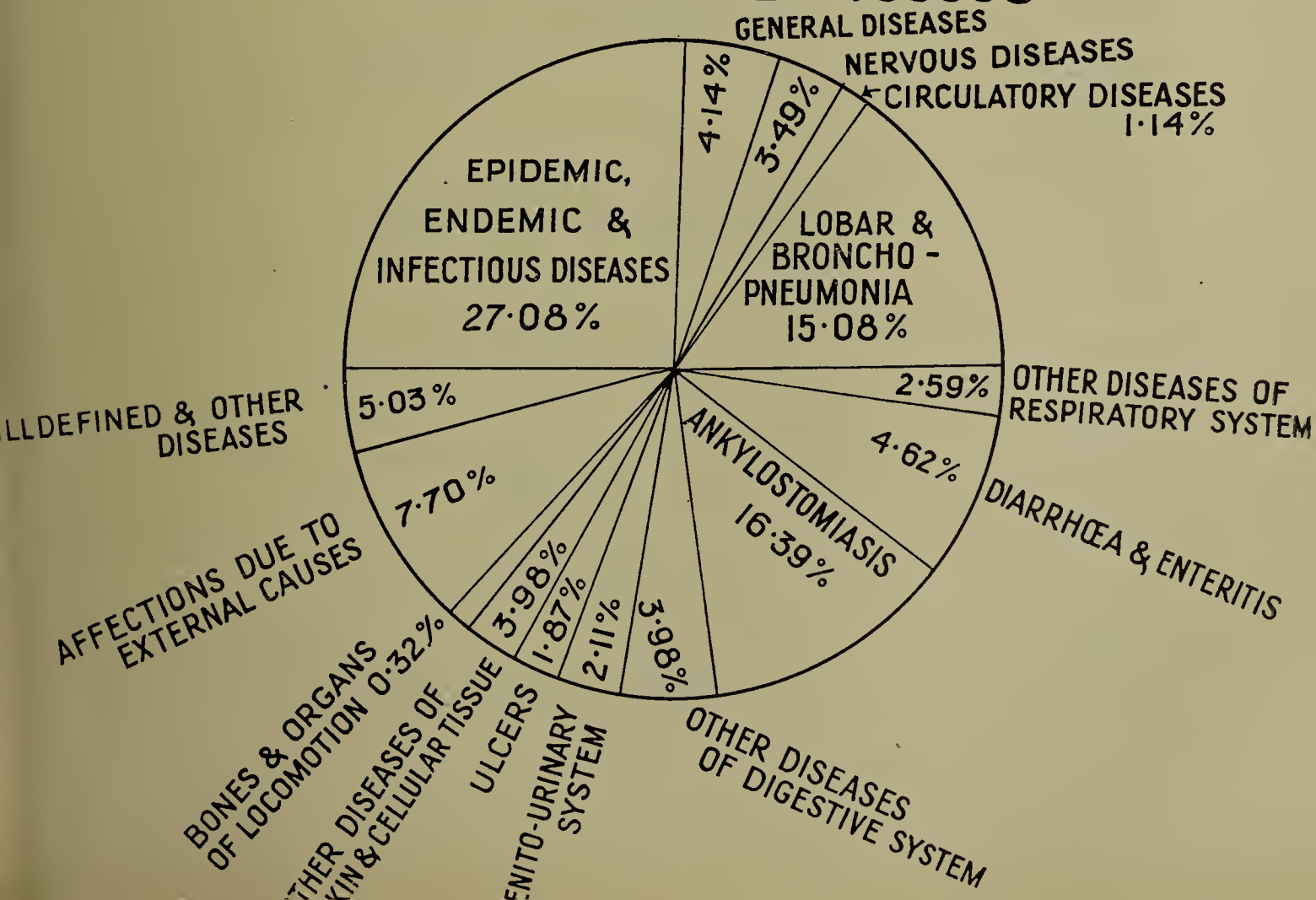
It is of interest to note that of the 200 hernia operations shown in the above table, 101 were performed by Dr. Connell. Of this figure, 92 were successful, 9 unsuccessful, and none died. The total number of operations conducted under a general anæsthetic performed by this officer, during the year, at the Sewa Hadji Hospital, was 498—a most praiseworthy record.

THE PROPORTION OF EPIDEMIC, ENDEMIC, SYSTEMIC, AND OTHER DISEASES SHEWN AS PERCENTAGES OF TOTAL CASES TREATED AT HOSPITALS AND DISPENSARIES.

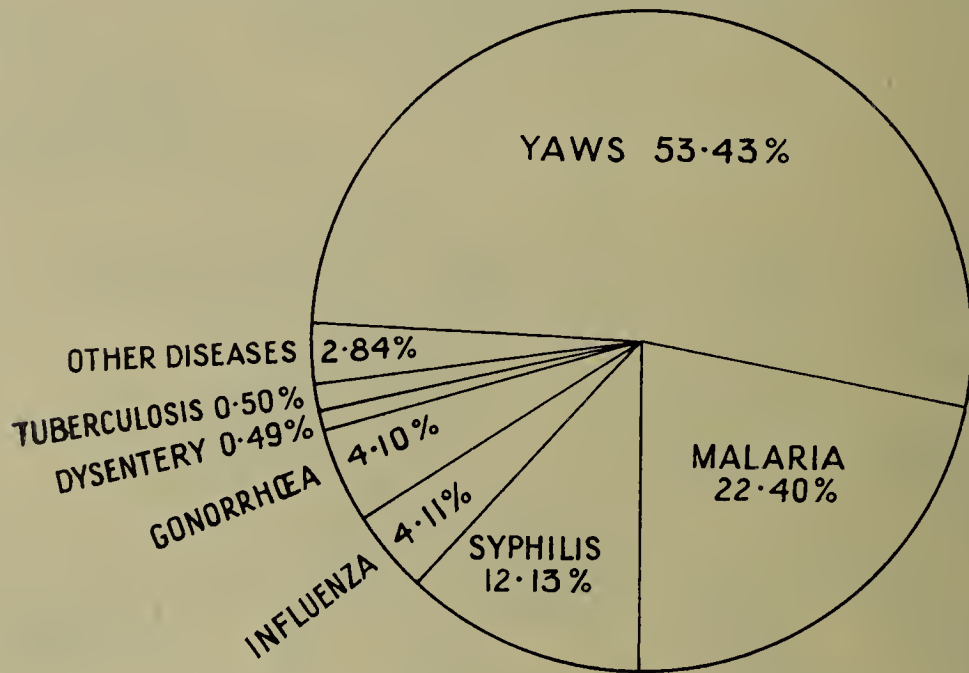
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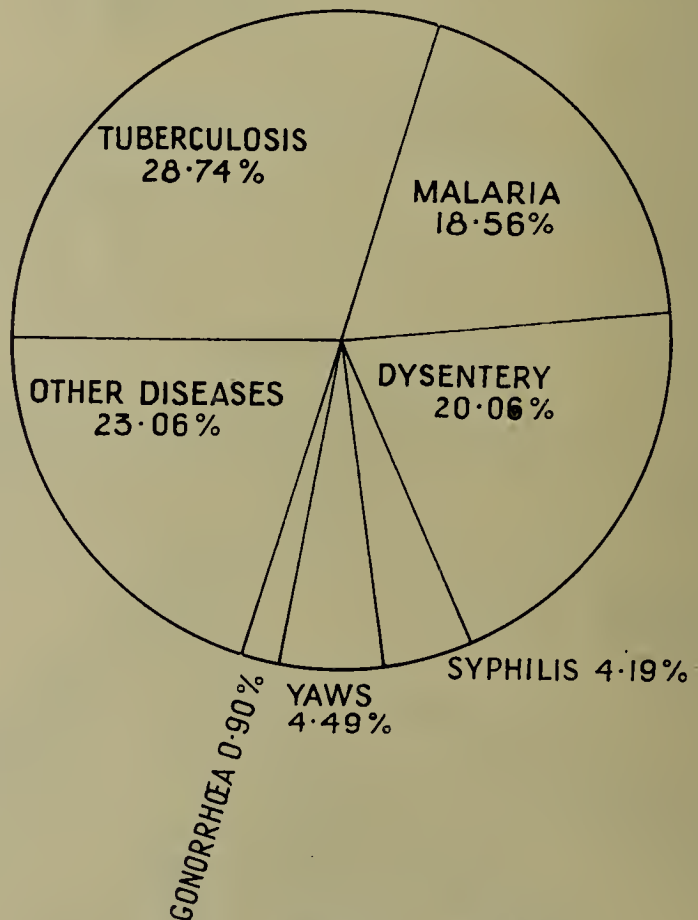
TOTAL INCIDENCE - 405558



PROPORTION IN PERCENTAGES OF EPIDEMIC, ENDEMIC AND
INFECTIOUS DISEASES, IN- AND OUT-PATIENTS, TREATED
AT HOSPITALS AND DISPENSARIES.



TOTAL INCIDENCE-150500



TOTAL DEATHS - 334

(b) Vital Statistics.

(1) GENERAL NATIVE POPULATION.

The most recent estimate of the population of the territory is computed at 4,740,726. No reliable statistics relating to birth, death and infant mortality rates are available at present.

(2) GENERAL EUROPEAN POPULATION.

Acknowledgment is made to the Registrar-General of Births and Deaths for a return of the registered deaths, a total of 61, which are summarised as follows :—

CAUSES OF DEATHS IN EUROPEANS DURING 1928.

(Classified according to the Manual of the International List of Causes of Deaths, 1926.)

I.—GENERAL DISEASES.

					Age	Nationality.		Place of death.
1.	Cerebral malaria	..	..	..	33	German	..	D.S.M.
2.	„	..	..	..	40/365	Greek	..	Tanga.
3.	„	..	..	..	17/12	German	..	Morogoro.
4.	„	..	..	..	33	British	..	Shinyanga.
5.	Malaria and heat stroke	..	..	..	35	German	..	Mbulu.
6.	„ „ cardiac failure	..	..	..	69	„	..	„
7.	„ chronic..	..	..	..	59	British	..	Moshi.
8.	Blackwater fever	..	..	..	44	German	..	D.S.M.
9.	„	..	..	..	38	Swiss	..	Kilwa.
10.	„	..	..	..	22	British	..	Tanga.
11.	„	..	..	..	38	German	..	„
12.	„	..	..	..	—	Swede	..	Arusha.
13.	„	..	..	..	26	Greek	..	„
14.	„	..	..	..	28	German	..	Usambara.
15.	Tuberculosis	..	..	..	57	British S.A.	..	Shinyanga.
16.	„ lungs	..	..	..	40	Norwegian	Naturalized	Tanga.
						British		
17.	„ „	..	..	..	49	British	..	Mbeya.
18.	Influenza	..	..	..	67	Dutch S.A.	..	Arusha.
19.	Typhoid fever	..	..	..	38	British	..	D.S.M.
20.	Dysentery	..	..	..	32	German	..	Morogoro.
21.	„	..	..	..	43	British	..	Mbeya.
22.	Septicæmia	..	..	..	28	French	..	Ufipa.
23.	„	..	..	..	24	German	..	Usambara.

II.—GENERAL DISEASES.

24.	Cancer of rectum	..	..	..	59	British	..	Manyoni.
25.	„ „ pharynx	..	..	..	39	„	..	Rungwe.
26.	„ (site not stated)	..	..	..	75	„	..	Tanga.
27.	„ „	..	..	..	78	Dutch S.A.	..	Arusha.
28.	Alcoholism	..	..	..	38	British	..	Mwanza.

III.—DISEASES OF NERVOUS SYSTEM AND SENSE ORGANS.

29.	Cerebral tumour	..	..	..	26	Dutch S.A.	..	Arusha.
30.	Acute delirium	..	..	..	42	British	..	Tabora.
31.	Paralysis (unqualified)	..	..	..	49	German	..	Nzega.

IV.—DISEASES OF THE CIRCULATORY SYSTEM.

32.	Valvular disease of the heart, acute dilatation during pregnancy	36	Italian	..	Dar-es-Salaam.
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V.—DISEASES OF THE RESPIRATORY SYSTEM.

33.	Pneumonia	53	Norwegian	..	Shinyanga.
34.	„	..	..	..	2	Dutch S.A.	..	Arusha.
35.	„	..	..	..	—	British	..	„
36.	„ double	..	..	..	32	Dutch	..	Mwanza.
37.	Empyema (traumatic)	..	..	..	55	British	..	Tabora.
38.	Pleurisy	..	..	..	—	„	..	Lindi.

VI.—DISEASES OF THE DIGESTIVE SYSTEM.

39.	Strangulated inguinal hernia and post-operative shock	..	..	..	47	German	..	Dar-es-Salaam.
40.	Acute infantile diarrhœa	..	..	..	1/12	Swiss	..	Usambara.
41.	Undetermined gastric condition	..	..	..	57/41	German	..	Morogoro.

(2) GENERAL EUROPEAN POPULATION—*continued.*

CAUSES OF DEATHS IN EUROPEANS DURING 1928—continued.

VII.—NON-VENEREAL DISEASES OF URO-GENITAL SYSTEM AND ANNEXA.

				Age.	Nationality.	Place of death.
42.	Chronic interstitial nephritis..	..	..	44	Italian	Dar-es-Salaam.
43.	" " " " ..	..	..	50	British	Moshi.

VIII.—THE PUERPERAL STATE.

44. Toxæmia of pregnancy	..	..	23	British	..	..	D.S.M.
45. Retained placenta sapræmia..	..	..	37	Dutch S.A.	..	..	Arusha.

XIII.—OLD AGE.

XIII.—OLD AGE.									
46. Senile morbus cordis	74	British	Songea.						

XIV.—EXTERNAL CAUSES.

				XIV. EXTERNAL CAUSES.			
47.	Wounds by lion, septicæmia	..	..	67	German	..	.. D.S.M.
48.	" animal, septicæmia	..	..	35	American	..	.. Kilosa.
49.	Multiple injuries (motor car accident)	..	..	27	German	..	.. Tanga.
50.	" " " "	..	..	39	"	..	.. Mbeya.
51.	Sunstroke	..	..	41	"	..	.. Mbulu.
52.	Accidental (gunshot wound)	..	..	32	Dutch	..	.. Tanga.
53.	" "	..	..	46	German	..	.. Kilosa.
54.	Suicide (gunshot wound)	..	..	40	British	..	.. Dodoma.
55.	" "	..	..	45	German	..	.. Rungwe.
56.	" by liquid poison	..	..	28	British	..	.. D.S.M.
57.	Murder	..	..	45	"	..	.. Mbulu.

XV.—ILL-DEFINED CAUSES.

58.	Cardiac syncope	..	..	..	..	51	British	..	..	..	D.S.M.
59.	„	..	..	..	..	51	Dutch	..	..	..	Tanga.
60.	Unknown	..	..	..	..	39	Greek	..	..	..	Nzega.
61.	„	..	..	..	..	56	British	..	..	..	Mbeva.

(3) EUROPEAN OFFICIALS.

Deaths.—There were six deaths among European officials, five being due to disease, and one to suicide.

	1926.	1927.	1928.
Malaria	—	1	—
Blackwater fever	2	—	—
Myocarditis, pericarditis, atheroma ..	1	—	—
Phthisis	1	1	—
Pneumonia	—	1	1
Accident, killed while hunting	—	1	—
Relapsing fever	—	1	—
Enteric fever	—	—	1
Cardiac syncope	—	—	1
Alcoholism (heart failure)	—	—	1
Bright's disease	—	—	1
Suicide	—	—	1
	<hr/> 4	<hr/> 5	<hr/> 6

Invalidings.—Five European officials were invalided during the year, as compared with 16 and 13 during the two preceding years.

	1926.	1927.	1928.
Blackwater fever	1	2	—
Alcoholism	—	—	1
Tuberculosis (pulmonary)	1	2	1
Neurasthenia	1	3	1
Tabes dorsalis	—	1	—
Chronic recurring appendicitis	1	—	—
Fractured thigh	—	1	—
Epilepsy	—	1	—
Chronic maxillary antrum abscess	—	1	—
Pyelitis	—	—	1
Chronic duodenal ulcer	—	1	—
Suppurative phlebitis	1	—	—
*Aortic aneurism	1	—	—
Carried forward	6	12	4

* Died at Mombasa on the way to England

(3) EUROPEAN OFFICIALS—*continued*.*Invalidings*—*continued*.

	1926.	1927.	1928.
Brought forward	6	12	4
Inflammation of the appendix	1	—	—
Chronic synovitis	1	—	—
„ colitis	1	—	—
General debility	1	—	—
Debility following enteric and malaria ..	1	—	—
Depressed fracture of the orbit	1	—	—
Indifferent health following typhoid ..	1	—	—
Inguinal hernia (left)	1	—	—
Perianal fistula	1	—	—
Cerebellar thrombosis	1	—	—
Injuries—mauled by leopard	—	1	—
Rheumatoid arthritis	—	—	1
	16	13	5

(4) ASIATIC OFFICIALS.

Deaths.—There were eight deaths among Asiatic officials, all of them being due to disease.

	1926.	1927.	1928.
Blackwater fever	2	7	4
Pneumonia	2	3	1
Asthma and bronchitis	1	—	—
Cerebral malaria	1	3	—
Pulmonary tuberculosis	1	—	1
Cardiac disease	—	1	—
Cirrhosis of liver	—	1	—
Peritonitis	—	1	—
Erysipelas	—	1	—
Diabetes	—	—	1
Cellulitis	—	—	1
	7	17	8

Invalidings.—Eight Asiatic officials were invalided during the year.

	1926.	1927.	1928.
Blackwater fever	—	1	—
Pulmonary tuberculosis	2	2	3
Chronic bronchitis	1	—	—
„ „ and emphysema	1	—	—
„ gastric ulcer	—	1	—
Disease of gall bladder	1	—	—
Gastritis	1	—	—
Malaria and relapsing fever	1	—	—
Rheumatic fever	1	—	—
Old age	1	—	—
Cerebral hæmorrhage	1	—	1
Hypochondriasis	1	—	—
General debility and muscular rheumatism	1	—	—
Chronic asthma	—	1	1
General weakness following spreading			
cellulitis	—	1	—
Pneumonia	—	1	—
Chronic malaria	—	1	1
Peripheral neuritis, chronic malaria and			
neurasthenia	—	1	—
Spastic paraplegia	—	1	—
Acute anterior poliomyelitis	—	—	1
Neurasthenia	—	—	1
	12	10	8

TABLE I.

SICK, INVALIDING AND DEATH RATES, EUROPEAN OFFICIALS, 1926, 1927 AND 1928.
(For the three Principal Towns and the Whole Territory.)

	Dar-es-Salaam.			Tabora.			Tanga.			Whole Territory.		
	1926.	1927.	1928.	1926.	1927.	1928.	1926.	1927.	1928.	1926.	1927.	1928.
1. Total number of Officials Resident..	398	424	452	111	129	138	62	71	79	983	1,038	1,375
2. Average number Resident ..	268	283	309	59	78	80	62	58	70	728	756	851
3. Total number on Sick List ..	276	288	358	47	109	62	48	36	66	662	754	756
4. Total number of Days on Sick List..	2,148	2,365	2,616	255	821	420	347	319	491	4,980	5,972	5,407
5. Average daily number on Sick List ..	5.88	6.48	7.17	0.69	2.25	1.15	0.95	0.87	1.35	13.64	16.36	14.81
6. Percentage of Sick to average number Resident	2.19	2.29	2.32	1.16	2.88	1.44	1.53	1.50	1.93	1.87	2.16	1.74
7. Average number of Days on Sick List for each Patient	7.78	8.21	7.31	5.42	7.53	6.77	7.23	8.86	7.44	7.52	7.92	7.15
8. Average Sick Time to each Resident	8.01	8.36	8.47	4.32	10.49	5.25	5.60	5.50	7.01	6.83	7.90	6.35
9. Total number Invalided ..	14*	8	5	—	2	—	—	1	—	16	13	5
10. Percentage of Invalidings to Total Resident	3.52	1.89	1.11	—	1.55	—	—	1.41	—	1.62	1.25	0.36
11. Total Deaths ..	1	2	2	—	—	2	—	—	—	4	5	6
12. Percentage of Deaths to Total Resident	0.25	0.47	0.44	—	—	1.44	—	—	—	0.40	0.48	0.44
13. Percentage of Deaths to average number Resident	0.37	0.71	0.65	—	—	2.50	—	—	—	0.54	0.66	0.71
14. Number of Cases of Sickness contracted away from Residence	—	—	—	—	11	—	—	—	—	20	47	41

* One died at Mombasa *en route* for England.

TABLE II.

SICK, INVALIDING AND DEATH RATES, ASIATIC OFFICIALS, 1926, 1927 AND 1928.
(For the three Principal Towns and the Whole Territory.)

	Dar-es-Salaam.			Tabora.			Tanga.			Whole Territory.		
	1926.	1927.	1928.	1926.	1927.	1928.	1926.	1927.	1928.	1926.	1927.	1928.
1. Total number of Officials Resident..	668	780	848	273	294	328	100	93	110	1,524*	1,591*	1,778*
2. Average number Resident	562	642	742	182	230	200	100	87	95	1,171*	1,251*	1,354*
3. Total number on Sick List	1,169	673	1,069	647	434	518	195	228	153	2,436	1,847	2,259
4. Total number of Days on Sick List..	5,845	3,032	5,391	2,712	1,649	2,401	1,226	1,089	1,457	12,040	8,044	11,928
5. Average daily number on Sick List ..	16.01	8.31	14.77	7.43	4.52	6.58	3.36	2.98	3.99	32.98	22.04	32.68
6. Percentage of Sick to average number Resident	2.84	1.29	1.99	4.08	1.96	3.29	3.26	3.43	4.20	2.73	1.76	2.41
7. Average number of Days on Sick List for each Patient	5.00	4.51	5.04	4.19	3.79	4.64	6.29	4.78	9.52	4.94	4.36	5.28
8. Average Sick Time to each Resident..	10.40	4.72	7.27	14.90	7.16	12	12.26	12.52	15.34	10.28	6.43	8.81
9. Total number Invalided	10	7	6	—	—	1	1	2	1	12	10	8
10. Percentage of Invalidings to Total Resident	1.49	0.90	0.71	—	—	0.30	1.00	2.15	0.90	0.79	0.63	0.44
11. Total Deaths	4	3	4	2	6	1	—	1	2	7	17	8
12. Percentage of Deaths to Total Resident	0.59	0.38	0.47	0.73	2.04	0.30	—	1.08	1.82	0.46	1.07	0.44
13. Percentage of Deaths to average number Resident	0.71	0.47	0.54	1.10	2.61	0.50	—	1.15	2.11	0.59	1.36	0.59
14. Number of Cases of Sickness contracted away from Residence	—	—	—	—	—	—	—	—	—	8	2	8

* Approximate only. Accurate figures not available.

TABLE III.
MORBIDITY RATES FOR MALARIA AND BLACKWATER FEVER AMONGST OFFICIALS—DAR-ES-SALAAM.

	EUROPEAN OFFICIALS.						ASIATIC OFFICIALS.											
	Total days off duty.			Days off duty for Malaria.			Days off duty for B.W. Fever.			Total days off duty.			Days off duty for Malaria.			Days off duty for B.W. Fever.		
	1926.	1927.	1928.	1926.	1927.	1928.	1926.	1927.	1928.	1926.	1927.	1928.	1926.	1927.	1928.	1926.	1927.	1928.
January	223	118	213	69	20	82	—	—	—	668	221	421	348	35	254	3	—	26
February	157	117	217	26	37	58	—	—	—	300	223	283	94	37	164	—	—	6
March	219	212	215	13	50	65	—	—	—	224	214	224	71	106	126	—	—	8
April	171	276	127	21	116	29	—	—	—	260	277	232	128	182	143	—	—	—
May	189	260	230	62	152	38	—	—	—	612	361	614	107	252	400	22	—	8
June	301	254	311	121	95	96	—	—	—	714	353	804	248	215	542	—	23	—
July	179	147	193	74	42	86	—	—	—	646	199	489	232	54	351	—	10	14
August	69	132	126	29	14	27	—	—	—	443	192	349	58	40	178	29	—	—
September	67	207	221	16	21	43	—	—	—	539	160	502	76	50	258	—	—	—
October	145	218	228	53	24	38	—	—	—	568	72	453	104	58	219	26	—	—
November	258	341	265	73	15	25	—	—	—	496	303	537	118	47	267	—	—	—
December	140	188	270	16	29	36	—	—	—	457	359	483	87	71	204	8	—	—
TOTAL	2,118	2,470	2,616	573	615	623	—	—	—	5,927	2,934	5,391	1,671	1,147	3,106	88	33	62

[illegible]

TABLE IV.
MORBIDITY RATES FOR MALARIA AND BLACKWATER FEVER AMONGST OFFICIALS---TANGA.

	EUROPEAN OFFICIALS.						ASIATIC OFFICIALS.											
	Total days off duty.			Days off duty for Malaria.			Days off duty for B.W. Fever.			Total days off duty.			Days off duty for Malaria.			Days off duty for B.W. Fever.		
	1926.	1927.	1928.	1926.	1927.	1928.	1926.	1927.	1928.	1926.	1927.	1928.	1926.	1927.	1928.	1926.	1927.	1928.
January ..	28	46	45	7	—	—	—	—	—	140	50	180	89	11	60	—	—	—
February ..	27	46	35	—	—	—	—	—	—	112	44	136	64	23	23	1	—	—
March ..	4	37	35	—	—	6	—	—	—	80	52	131	23	12	12	30	5	—
April ..	13	12	83	—	7	14	—	—	—	56	67	129	20	43	32	—	—	—
May ..	9	59	63	—	53	12	—	—	—	118	212	90	73	99	31	—	—	—
June ..	29	10	34	10	10	5	—	—	—	134	102	55	102	70	37	—	—	—
July ..	61	1	20	28	1	4	—	—	—	142	87	115	66	21	52	—	—	—
August ..	33	1	28	4	—	12	—	—	—	106	75	160	38	10	52	—	—	3
September ..	34	14	38	8	—	5	—	—	—	75	118	162	31	30	44	5	—	1
October ..	20	10	44	7	3	12	—	—	—	94	58	101	3	20	42	25	—	3
November ..	29	—	35	9	—	6	—	—	—	72	52	91	15	33	41	—	—	—
December ..	56	87	31	—	—	6	—	—	—	89	198	107	25	63	22	—	—	—
TOTAL ..	343	323	491	73	74	82	—	—	—	1,218	1,115	1,457	549	435	448	61	5	7

[illegible]

TABLE V.
MORBIDITY RATES FOR MALARIA AND BLACKWATER FEVER AMONGST OFFICIALS—TABORA.

[illegible]

Recommendations.

1. A larger staff of European sanitary superintendents is required.
2. The improvement of water supplies, drainage generally, and especially in connection with anti-malarial measures at Dar-es-Salaam, are still pressing.
3. Early steps should be taken towards the establishment of sewage disposal at Dar-es-Salaam.
4. Legislation should be promulgated for the provision of adequate medical treatment and the safeguarding of the health of the labourer.

III.—HYGIENE AND SANITATION.

REPORT BY DR. J. O. SHIRCORE, FOR DEPUTY DIRECTOR OF SANITARY SERVICE.

(a) General Review of Work done and Progress made.

While a satisfactory sanitary condition of the territory has been maintained, there can be little doubt that the increase in population of the larger towns demands the adoption of early measures towards the improvement of water supplies, drainage and sewage disposal.

The year 1928 was the fourth year of abnormal rainfall, and, as a consequence, the malaria rate remained at a comparatively high level.

(1) *Preventive Measures.*

MOSQUITO AND INSECT-BORNE DISEASES.

Malaria accounted for 33,731 cases treated at Government hospitals.

						1926.	1927.	1928.
Cases	..	..	..	..	..	29,856	29,673	33,731
Deaths	..	..	..	..	..	41	40	47

Acting under the instructions of the Director of Medical and Sanitary Services, the Government Entomologist, Mr. McHardy, visited Usambara and the Northern Provinces. He submitted an interesting report, see p. 225, and it is satisfactory to know that the anti-malarial measures advocated for Tanga and Arusha do not offer difficult problems. The work which has already been done by the Health Officers at Tanga and Tabora, both of which places were in the past notorious infective centres of malaria and blackwater fever, has resulted in an exceptionally low incidence of these diseases at those towns.

The greater proportion of the increase of malaria shown during 1928 was due to the occurrence of larger numbers of cases at Dar-es-Salaam and Moshi. A European sanitary superintendent has been stationed at Moshi for some time, and one hopes to see a reduction of malaria in future years, but it is felt that, unless drainage is established at Dar-es-Salaam, further work on the lines maintained hitherto is unlikely to produce an improvement in the present situation.

Blackwater Fever.—There were 60 cases with 14 deaths, 12 and 25 cases less than the two preceding years.

Sleeping Sickness.—See the Sleeping Sickness Officer's Report on page 170.

Yellow Fever.—Nil.

Filariasis.—The extensive distribution of filariasis over vast areas is quite beyond the scope of the health department. It is probable, however, that with the improvement in village sanitation through the activities of the African District Sanitary Inspectors some reduction in the incidence might ultimately be attained.

Dengue.—

	1926.	1927.	1928.
Cases	71	21	10

There has been a marked reduction of dengue in the towns of the coastal belt. Two cases were reported from Iringa for the first time.

Relapsing Fever.—Whereas there has been an increase of 39 cases over the previous year—312 against 273—there was only one death. There has been no change in the distribution and the endemic areas appear to be constant.

EPIDEMIC DISEASES.

No epidemic of note occurred during the year; 26 cases of smallpox were reported, and there was a threat on the Rhodesian border, but no overflow occurred.

A table of vaccinations performed, compiled from the Station Reports, follows:—

TABLE SHOWING VACCINATIONS PERFORMED DURING 1928.

Provinces.	Primary Vaccinations.				Re-Vaccinations.			
	Total.	Number re-inspected.	Successful.	Unsuccessful.	Total.	Number re-inspected.	Successful.	Unsuccessful.
Central	61,144	54,108	45,547	8,516	3,205	2,355	1,476	879
Tanga	24,784	—	8,690	4,327	—	—	—	—
Northern	4,138	3,768	1,997	373	727	355	199	173
Eastern	31,661	24,151	14,866	6,125	7,726	4,841	3,400	1,441
Mahenge	9,175	9,175	7,109	2,066	890	890	433	457
Lindi	16,150	7,419	10,830	4,001	—	—	—	—
Iringa	39,033	20,072	23,925	9,769	256	—	—	—
Kigoma	32,606	8,153	11,820	18,900	2,388	2,309	512	1,161
Bukoba	17,928	—	—	—	—	—	—	—
Mwanza	3,619*	—	—	—	—	—	—	—
Tabora	50,215	28,487	20,424	12,063	1,613	1,164	617	547
TOTAL	290,453	155,333	145,208	66,140	16,805	11,914	6,637	4,658

* From the return furnished to the D.D.L.S.

Cerebro-spinal Meningitis.—Nine cases with six deaths were notified from five districts.

Plague.—There were 36 cases with 35 deaths in the Musoma endemic area in which recrudescence occurs at periodic intervals. Two interesting minor outbreaks were reported from Image in the Iringa district and a small village on the Kisigo River, in the Manyoni district of the Central Province. The latter area, although only 14 miles by road away from Manyoni station on the Central Railway, lies several hundred feet below the escarpment. Image is situated about 25 miles from Iringa, and is 150 miles from Kilosa. The former focus is an old one at which a few cases occurred during 1920. At Image there were three cases and at Kisigo four. They were confirmed by the Deputy Director of Laboratory Service, and the usual measures were adopted resulting in prompt control of the position.

The interesting point is that both these outbreaks were recognised and reported in the first instance by the African District Sanitary Inspectors in charge of the areas, who also independently undertook the necessary immediate preventive measures, such as

the segregation of cases, killing of rats, cleansing of the huts, etc. The Sanitary Inspector's written report from Kisigo gave a clear description of the clinical features of the disease, the mortality amongst the village rats, and further stated that although he had already arranged to leave the village on tour he postponed his departure in order to cope with the situation.

It is obvious from these examples that the African branch of the sanitation department is capable of rendering valuable services.

Epidemic Influenza.—540 cases with 8 deaths were reported from the Tanga area.

Measles and Chickenpox.—Both these diseases were reported from many points in the territory, but nothing of the nature of an epidemic was noted.

Table showing the incidence of dangerous infectious diseases during the last five years 1924–1928 :—

—		Smallpox.		Cerebro-spinal meningitis.		Plague.		Influenza.	
Year.		Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
1924	.. ..	30	12	2	1	42	35	—	38
1925	.. ..	1,388	466	6	3	44	27	692*	64
1926	.. ..	22	—	8	4	6	6	1,552*	209
1927	.. ..	84	8	7	6	13	10	—	—
1928	.. ..	26	—	†7	†3	43	42	540	8

* Total cases not known.

† Cases and deaths notified in Bulletin.

Enteric Fever.—31 cases of enteric, 5 of paratyphoid A, 1 of B, and 2 type not defined, were reported, with 4 deaths. Only 16 of the above occurred amongst Europeans. The totals for 1927 were 27 cases with 6 deaths.

Dysentery.—See the Director of Medical and Sanitary Services' Report on page 11.

Hepatic abscess accounted for 42 cases and 4 deaths.

INCIDENCE OF PRINCIPAL INFECTIOUS DISEASES DURING 1926, 1927 AND 1928.

(Compiled from telegraphic returns received weekly from Medical Stations. The figures are frequently obtained from Native information, and are not always reliable.)

DISTRICTS.	Smallpox.						C.S.M.						Plague.						Influenza.					
	1926.		1927.		1928.		1926.		1927.		1928.		1926.		1927.		1928.		1926.		1927.		1928.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
NORTHERN AREA :																								
Bukoba ..	—	—	—	—	—	—	3	—	—	—	—	—	6	—	—	—	—	—	—	—	—	—	—	—
Mwanza ..	—	—	—	—	—	—	3	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Arusha ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Usambara ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Moshi ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
CENTRAL AREA :																								
Tabora ..	10	—	2	1	5	—	—	—	2	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dodoma ..	—	—	1	1	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Kondoa-Irangi ..	—	—	1	—	4	—	1	1	1	—	3	1	—	—	—	—	—	—	—	—	—	—	—	—
Morogoro ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
SOUTHERN AREA :																								
Iringa ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mahenge ..	—	—	34	—	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Songea ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
WESTERN AREA :																								
Kigoma ..	—	—	—	—	7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ufipa ..	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rungwe ..	2	—	—	—	—	—	—	—	—	—	2	2	—	—	—	—	—	—	—	—	—	—	—	—
COASTAL AREA :																								
Tanga ..	1	—	—	—	—	—	1	1	3	3	2	—	—	—	—	—	—	—	—	—	—	—	—	—
Pangani ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bagamoyo ..	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Dar-es-Salaam ..	—	—	37	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Rufiji ..	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Kilwa ..	7	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lindi ..	—	—	8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mafia Island ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	22	—	84	8	26	—	8	4	7	6	7	3	6	6	13	10	43	42	1,552	209	—	—	540	8

* Total number of cases not known.

INCIDENCE OF PRINCIPAL INFECTIOUS DISEASES DURING 1928.

(Compiled from telegraphic returns received weekly from Medical Stations. The figures are frequently obtained from Native information, and are not always reliable.)

Provinces (area in square miles).	Districts.	Area (square miles).	Population.	Small-pox.		Plague.		In-fluenza.		*Other Infectious Diseases.	
				Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
CENTRAL :											
Area .. 38,770	Dodoma ..	11,830	166,775	3	—	4	4	—	—	—	—
Population 607,467	Singida ..	8,160	235,461	—	—	—	—	—	—	—	—
	Kondoa ..	5,750	160,319	4	—	—	—	—	—	3	1
	Manyoni ..	13,030	44,912	—	—	—	—	—	—	—	—
TANGA :											
Area .. 13,863	Tanga ..	1,457	95,871	—	—	—	—	540	8	2	—
Population 349,375	Pangani ..	982	24,835	—	—	—	—	—	—	—	—
	Handeni ..	4,930	56,015	—	—	—	—	—	—	—	—
	Usambara ..	2,624	117,006	—	—	—	—	—	—	—	—
	Pare ..	3,870	55,648	—	—	—	—	—	—	—	—
NORTHERN :											
Area .. 33,770	Arusha ..	7,250	40,311	—	—	—	—	—	—	—	—
Population 324,991	Moshi ..	2,120	147,447	—	—	—	—	—	—	—	—
	Masai ..	18,470	41,822	—	—	—	—	—	—	—	—
	Mbulu ..	5,930	95,411	—	—	—	—	—	—	—	—
EASTERN :											
Area .. 27,320	Dar-es-Salaam	4,080	164,422	—	—	—	—	—	—	—	—
Population 519,236	Rufiji ..	5,710	74,037	—	—	—	—	—	—	—	—
	Bagamoyo ..	3,910	58,192	—	—	—	—	—	—	—	—
	Morogoro ..	7,620	153,001	—	—	—	—	—	—	—	—
	Kilosa ..	6,000	69,584	—	—	—	—	—	—	—	—
MAHENGE :											
Area .. 32,730	Mahenge ..	15,570	98,017	5	—	—	—	—	—	—	—
Population 197,572	Songea ..	17,160	99,555	—	—	—	—	—	—	—	—
LINDI :											
Area .. 38,910	Lindi ..	5,233	76,706	—	—	—	—	—	—	—	—
Population 357,255	Kilwa ..	18,636	83,535	—	—	—	—	—	—	—	—
	Mikindani ..	3,495	124,988	—	—	—	—	—	—	—	—
	Masasi ..	11,546	72,026	—	—	—	—	—	—	—	—
IRINGA :											
Area .. 41,450	Iringa ..	14,830	65,169	—	—	3	3	—	—	—	—
Population 413,882	Njombe ..	8,330	114,716	—	—	—	—	—	—	—	—
	Rungwe ..	1,750	148,872	—	—	—	—	—	—	2	2
	Mbeya ..	16,540	85,125	—	—	—	—	—	—	—	—
KIGOMA :											
Area .. 48,345	Kigoma ..	11,600	36,412	7	—	—	—	—	—	—	—
Population 290,519	Kasulo ..	3,830	103,840	—	—	—	—	—	—	—	—
	Kibondo ..	5,580	62,248	—	—	—	—	—	—	—	—
	Ufipa ..	27,275	88,019	2	—	—	—	—	—	—	—
BUKOBÄ :											
Area .. 11,010	Bukoba ..	6,010	237,863	—	—	—	—	—	—	—	—
Population 348,036	Biharamulo ..	5,000	110,173	—	—	—	—	—	—	—	—
MWANZA :											
Area .. 25,530	Mwanza ..	5,580	240,235	—	—	36	35	—	—	—	—
Population 798,647	Maswa ..	10,870	211,865	—	—	—	—	—	—	—	—
	Musoma ..	7,250	180,136	—	—	—	—	—	—	—	—
	Kwimba ..	1,830	166,411	—	—	—	—	—	—	—	—
TABORA :											
Area .. 40,230	Tabora ..	23,650	182,918	5	—	—	—	—	—	—	—
Population 533,746	Shinyanga ..	3,750	149,109	—	—	—	—	—	—	—	—
	Nzega ..	5,500	121,685	—	—	—	—	—	—	—	—
	Kahama ..	7,330	80,034	—	—	—	—	—	—	—	—
TOTAL	—	351,928	4,740,726	26	—	43	42	540	8	7	3.

* NOTE.—All cases shown under Other Infectious Diseases are cases of C.S.M.

HELMINTHIC DISEASES.

See Director of Medical and Sanitary Services' Report, page 10 and Nos. 115–116 of Tables V and VI on page 261.

Leprosy.—During the year grants of money were made by the British Empire Leprosy Relief Association, through the courtesy of Mr. Oldrieve, who had the opportunity of studying the leper question at first hand during his visit to the territory, and a total of £700 was allocated to the following Missions :—

The Benedictine Mission, Ndanda ..	..	..	..	..	£ 350
The Italian Consolata Mission, Iringa ..	..	..	..	..	300
The White Fathers, Dar-es-Salaam ..	..	..	..	..	50
					<hr/> £700 <hr/>

A consignment consisting of 400 lb. of *hydnocarpus anthelmintica* oil was gifted by the above Society. The bulk of the above has been distributed to the various Missions undertaking anti-leprotic work.

The total sum allocated to Missions by the Government for the maintenance of lepers is £1,600.

Through the kindness of the Director of Agriculture, 100 lb. *hydnocarpus anthelmintica* seeds were sent to 19 leper settlements for planting.

It is too early yet to know whether or not the attempt is proving successful.

TABLE SHOWING INCIDENCE OF TUBERCULOSIS AT THE VARIOUS STATIONS IN THE TERRITORY DURING 1926, 1927 AND 1928.

	1926.				1927.				1928.			
	Pulmonary		All other Forms.		Pulmonary		All other Forms.		Pulmonary		All other Forms.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.
Arusha	29	3	4	—	53	—	10	—	35	2	8	1
Bagamoyo	—	—	—	—	—	—	42	—	7	—	2	—
Biharamulo	1	1	—	—	1	—	2	1	—	—	—	—
Bukoba	8	—	11	2	2	—	4	—	2	2	5	—
Dar-es-Salaam—												
European Hospital ..	7	1	—	—	6	1	1	1	11	2	—	—
Sewa Hadji Hospital ..	41	3	—	—	27	3	4	—	33	1	12	1
*Health Office	—	—	11	2	9	6	—	—	44	—	—	—
*Private Practitioners ..	—	—	7	—	11	1	—	—	8	—	—	—
Dodoma	—	—	7	3	5	1	2	2	12	—	2	—
Handeni	1	—	—	—	3	—	2	1	—	—	6	—
Iringa	1	1	—	—	1	—	3	1	6	5	6	2
Kahama	—	—	2	—	1	—	2	1	3	1	—	—
Kasanga	6	—	—	—	—	—	—	—	—	—	—	—
Kasulo	3	—	1	—	—	—	—	—	—	—	3	—
Kibata	7	—	—	—	—	—	6	—	1	—	2	—
Kibaya	5	—	—	—	—	—	—	—	—	—	2	—
Kibondo	—	—	—	—	3	1	1	—	1	—	—	—
Kigoma	4	1	1	1	3	—	2	1	3	—	2	—
Kilosa	5	1	—	—	9	—	3	—	5	2	1	—
Kilwa	—	—	—	—	—	—	3	—	3	—	2	—
Kisaki	—	—	—	—	—	—	1	—	—	—	1	—
Kondoa	9	5	—	—	14	3	5	—	6	1	1	1
Lindi	12	1	—	—	7	—	6	—	5	1	—	—
Lushoto	11	3	—	—	1	—	—	—	4	3	4	—
Mafia	—	—	—	—	5	1	—	—	—	—	1	—
Mahenge	1	—	—	—	1	1	1	—	3	—	2	—
Malangali	—	—	—	—	—	—	—	—	—	—	—	—
Manyoni	1	—	—	—	—	—	—	—	—	—	—	—
Mbeya	—	—	—	—	1	—	—	—	4	1	2	—
Mbulu	6	3	—	—	21	3	3	—	6	2	—	—
Mikindani	4	—	—	—	1	—	5	—	2	—	—	—
Mkalama	2	—	9	—	4	—	1	—	1	—	1	—
Morogoro	51	16	2	2	18	—	—	—	19	5	1	—
Moshi	36	6	7	—	35	5	5	—	14	5	4	1
Mpwapwa	—	—	—	—	1	—	—	—	—	—	—	—
Musoma	4	2	3	1	5	—	4	—	2	—	6	—
Mwanza	6	—	—	—	33	5	8	1	16	3	7	—
Mwaya	—	—	—	—	1	—	—	—	—	—	2	—
Namanyere	3	—	1	—	1	—	1	—	6	—	1	—
Nzega	—	—	—	—	1	—	3	—	7	1	6	1
Pangani	20	4	—	—	25	6	—	—	13	6	3	—
Shinyanga	1	—	4	—	6	—	7	—	2	1	—	—
Singida	1	—	13	1	9	—	9	—	3	2	6	1
Songea	9	1	2	1	11	1	—	—	9	2	13	—
Tabora	3	2	—	—	8	3	1	—	19	10	2	—
Tanga	48	11	1	—	80	18	13	2	150	51	9	—
Tukuyu	7	2	1	—	6	—	7	1	3	—	1	—
Tunduru	—	—	—	—	3	1	—	—	—	—	—	—
Ujiji	1	—	—	—	1	—	2	—	3	—	4	—
Utete	—	—	3	1	—	—	—	—	2	1	—	—
Kibongoto (Moshi) ..	—	—	—	—	40	—	11	—	70	6	36	—
* .. District work ..	—	—	—	—	116	—	115	—	406	—	206	—
Kahama Maternity and Child Welfare Centres ..	—	—	—	—	—	—	—	—	35	1	6	—
TOTAL	354	67	90	14	589	60	295	12	984	117	378	8
Railhead Returns	—	—	—	—	1	—	—	—	—	—	—	—
Miscellaneous Dispensaries, Missions, etc.	—	—	—	—	—	—	3	—	—	—	—	—
GRAND TOTAL	354	67	90	14	590	60	298	12	984	117	378	8

* Not included in Tables V and VI.

(2) *General Measures of Sanitation.*

The sanitation of all the towns in the territory might be regarded as satisfactory. There is, however, definite necessity for an improved water supply in many areas, particularly the larger towns, such as Dar-es-Salaam, Mwanza, Dodoma, Iringa and some of the smaller stations, where during the dry season water is scarce and not infrequently hardly potable. Such drainage as has been done on a small scale at Tabora has resulted in a marked reduction in the morbidity due to malaria and blackwater fever. It is hoped that it will not be long before a sewerage and drainage system is established at Dar-es-Salaam.

The sanitation of the larger towns is carried out by Health Officers aided by European Sanitary Superintendents. In other areas the staff varies with the size of the township, generally the sanitary routine is conducted by the medical officer or sub-assistant surgeon through a staff of African urban or district sanitary inspectors.

Tours were made by either the Director of Medical and Sanitary Services, Deputy Director of Medical Service or Deputy Director of Sanitary Service, and the following stations were inspected: Kilosa, Dodoma, Tabora, Bukeni, Kahama, Itaranganya, Nzega, Maswa, Shanwa, Mwanza, Musoma, Iringa, Lushoto, Moshi, Kibongoto, Machame, Arusha, Kondoa Irangi, Kigoma, Kasanga and Lake coast ports.

(3) *School Hygiene.*

A great deal of useful work is done by the medical and health staffs, by weekly, in some places, daily, inspections of the school children. Where there are schools at stations at which maternity and child welfare clinics are also established, the health visitors attend daily and children that require attention are either treated at the school dispensary or at the clinic.

It is unfortunate that, except at Dar-es-Salaam and Tanga, there is no dental treatment available, which must result in a great deal of suffering of the African child.

(4) *Labour Conditions.*

Although the health of the labourer and the conditions of life on the plantations are improving, it must not be lost sight of that the improvement may not be keeping pace with the larger numbers now employed. There have been more cases of scurvy and beri-beri during 1928 than in the preceding year, and in the Morogoro district the plantation morbidity and mortality due to ankylostomiasis was much higher than it has been before. Diseases of the digestive system have also shown an increase.

It is considered that it is not too early in the development of the territory to ask that legislation be promulgated, with the object of safeguarding the health of the African labourer.

(5) *Housing and Town Planning.*

Twelve ordinary and three extraordinary meetings of the Central Town Planning and Building Committee were held during the year. Sites for schools, government residential quarters, hospitals, offices, and commercial buildings, were allocated, and reservations of land for future residential purposes at some of the large townships were recommended for approval. With certain reservations the Committee agreed to the lay-out of Sea View site, Dar-es-Salaam, and the townships of Biharamulo, and Mbulu.

Consequent on a letter received from the township authority, Dar-es-Salaam, on the subject of building rules, the Committee considered that the existing rules required amendment, and recommended the appointment of a Select Committee for the purpose of revising the building sections of the township rules.

At an Extraordinary Meeting called at the request of a Special Committee appointed to consider the sites available for Government buildings in Dar-es-Salaam, and the most economical uses to which they could be put, the Central Town Planning and Building Committee discussed the questions of sites for general department stores, garages and workshops, police, prison and warders' lines, magistrate's court and police station, railway offices, and a town hall with municipal and health offices.

TOWN PLANNING.

In connection with the Survey of Dar-es-Salaam now proceeding the Director of Surveys has kindly supplied the two photographs shown below which were taken by himself from the air.

These have been selected from numerous others with a view to illustrate the lines on which the development of the Native town is proceeding.

AERIAL PHOTOGRAPHS TAKEN IN DAR-ES-SALAAM.

(Scale about 1—1250.)



1.—NEW NATIVE QUARTER. Portions of Twiga Street and Swahili Street.



2.—OLD PART OF TOWN. Portions of Bagamoyo Street and Sultan Street.

The upper photograph shows a portion of the new Native quarter laid out since 1923, with its broad streets and houses of the usual Native construction, *i.e.*, wattle and daub with thatched roof, each plot carefully laid out by the Survey Department, and the erection of the house supervised by the building inspector attached to the Health Office ; the lower photograph shows an older part of the town with the buildings irregularly spaced and many of them following no definite alignment.

(6) *Food in relation to Health and Disease.*

The question of deficiency disease has been dealt with by the Director of Medical and Sanitary Services in several of the previous annual reports.

It is one of the most important and difficult problems of the territory. Deficiency of calcium, fat, fat soluble A and D, exists over a very wide area, and must influence in no little degree the incidence of disease, due to the lowered resistance which occurs when the diet is lacking in these respects.

But until the areas under the tsetse fly are reduced substantially it is improbable that much can be done to improve matters.

An item of importance, however, in connection with the food supplies of plantation labour, is the dependence of the employer on contract supply. Contractors, more often than not, provide articles of diet such as meal and beans which have deteriorated, or are actually unfit for human consumption. It would be wiser for the planter to reserve a sufficient acreage to allow of staple foodstuffs being grown on the plantation, thereby, not only cutting out the middleman, but obtaining wholesome supplies for his labour.

An attempt to provide a useful vegetable, rich in vitamin, is being made by the extensive distribution of tomato seeds, and it will be interesting to see what the results are.

(7) *Traffic in Opium and other Dangerous Drugs.*

During the year two packets containing morphine posted at Budapest were seized by the postal authorities in Dar-es-Salaam and the usual routine communication regarding the disposal of the packets was sent to the Office of Origin in accordance with the International Postal Convention as required in Section b of Article IX of the enclosure to the Secretary of State's despatch No. 3 of 3rd February, 1927. Besides the above 2 lb. 4¼ oz. of opium was found in the possession of two Chinese residents of Dar-es-Salaam. The opium was seized and a conviction obtained by the police.

(b) Measures taken to spread the knowledge of Hygiene and Sanitation.

With the exception of baby shows and lantern demonstrations held by Dr. Lester in the Kahama district no special measures were taken.

The process of educating the African to a hygienic standard of living is being promoted, if somewhat gradually, through the activities of the members of several departments—the administrative by means of the Native authorities, the agricultural through European and African staff, the education department through the teacher, the medical by the help of the African dispensers and district sanitary inspectors, and the tribal authorities through the tribal dressers.

(c) Training of Sanitary Personnel.

This subject was dealt with fully in last year's report and no further comments are necessary.

We have at present 272 African urban and district sanitary inspectors and the proposal is to train a few as further demands arise.

(d) Recommendations for Future Work .

My recommendations have been included in the Director of Medical and Sanitary Services' Report.

EXTRACT FROM THE REPORT OF THE MEDICAL OFFICER OF HEALTH,
DAR-ES-SALAAM.

BY DR. A. I. MEEK, L.R.C.P., L.R.C.S., D.P.H. (EDIN.), L.R.F.P. & S. (GLAS.), D.T.M.
(LIV.)

Dr. R. R. Scott, Senior Sanitation Officer, was in charge of the work until his departure on leave to United Kingdom at the end of July. Dr. Meek, Sanitation Officer, arrived in June and took over the duties of Medical Officer of Health and Executive Officer, Township Authority, from the 26th July until 17th December, then being granted local leave on account of sickness. He was relieved by Dr. Folliot, Senior Sanitation Officer, on transfer from Nyasaland, who assumed the duties of Medical Officer of Health, and by Mr. Wilkie Johnstone, magistrate, who was temporarily seconded to the appointment of Executive Officer to the Dar-es-Salaam Township Authority.

During the first half of the year both Health Office and Township Authority Office were working understaffed. Dr. Scott, in his Annual Report for 1927, has already made reference to the death of Mr. de Souza in February, 1928. This officer was formerly in charge of anti-mosquito drainage measures. No one was available to take over the supervision of this most important work until the arrival in July, of Mr. Rance, Sanitary Superintendent. With regard to Township Authority work, from January until August, Mr. Morgan, Building Inspector, had alone to cope with the authority office work in addition to his building inspection duties. The return from leave of Mr. Walton, Township Authority clerk, and the seconding of Mr. Rowe, Senior Sanitary Superintendent, for Township Authority work in addition to Mr. Gray, Inspector of Works, Public Works Department, who eventually took over the duties of Building Inspector, considerably relieved the situation, although the constantly increasing volume of Township Authority work continued to absorb the bulk of the Medical Officer of Health's time, resulting in his being unable to give the necessary attention to the work appertaining to his own office. The appointment of a whole-time executive officer in December was the only logical remedy, and it is to be hoped that this appointment will be made a permanent one.

It is to be regretted that the Medical Officer of Health was unable to devote adequate time to the training of African Urban Sanitary Inspectors. Systematic theoretical instruction was only possible during the few weeks when Dr. Scott and Dr. Meek were working conjointly. Thirteen Inspectors were under training, and six passed the test examination, qualifying as African Urban Sanitary Inspectors.

Two candidates were given practical instruction in the duties of African District Sanitary Inspectors with a view to being detailed to vacancies occurring at out-stations on account of the death and sickness respectively of two Inspectors formerly employed on this work. These Probationary District Inspectors, accompanied by an Urban Inspector, gained experience by carrying out regular inspections of villages in the immediate vicinity of Dar-es-Salaam Township, which had not previously been visited. Unfortunately, no European officer of this Department was available for a general inspection of out-district stations under the supervision of African District Sanitary Inspectors.

The appointment of an analytical chemist was made during the year and has been of value to this office in connection with the inspection of food.

No serious outbreaks of the major infectious diseases occurred during the year. A detailed report of infectious diseases notified and of those treated at the Infectious Diseases Hospital and quarantined at the Nunge Leper Settlement, has been prepared by Dr. Clemmey, who has been in charge of this work since the transfer of Dr. Wilcocks to Kahama District in August. His reports on Port Health work and vaccination are also appended.

A separate report on Child Welfare work rendered by Dr. Clarke who is in charge of this section, is attached.

The usual tables relating to anti-mosquito work and malaria have been prepared. A high larvæ collection rate was in evidence during the first half of the year. This was inevitably due to the unusual raising of the subsoil water level owing to heavy rains in the last quarter of 1927, and the lack of adequate supervision of anti-mosquito measures

during the period under review. Later on, however, much good work was carried out by Mr. Rance, and seepage areas at Kurasini, Gerezani and Msimbazi were surveyed and successfully tapped by surface and agricultural drains.

The situation with regard to disposal of sewage has been aggravated during the year on account of the high subsoil water level in certain areas, and the increasing number of cesspits being constructed throughout the township. In spite of the fact that more modern cesspit emptying equipment was available during the latter half of the year, difficulty was experienced in preventing nuisance arising on account of overflowing cesspits. The pressing need for a proper sewerage system has been sufficiently emphasized in previous reports. The need is now even more urgent.

INFECTIVE DISEASES : PREVENTIVE MEASURES.

Mosquito-borne Diseases :—

COMPARATIVE TABLE SHOWING COLLECTIONS OF MOSQUITO LARVÆ IN DAR-ES-SALAAM TOWNSHIP.

							1926.	1927.	1928.
Anopheles	..	..	..	..	..	..	359	44	284
Culex	..	..	..	..	..	..	716	326	715
Stegomyia	..	..	..	..	..	..	1,266	893	1,336
TOTAL	..	..	..	..	..	..	2,341	1,263	2,335

ADULT MOSQUITOES CAUGHT BY ADULT CATCHER, DAR-ES-SALAAM, DURING 1928.

Anopheles	..	..	..	..	1,632
Culex	..	..	..	..	19,817
Stegomyia	..	..	..	..	10

Adult Anopheles were caught in the following areas :—

- Upanga Road on 11 occasions.
- Ocean Road on 16 occasions.
- Gerezani on 44 occasions.
- K.A.R. Cantonment on 50 occasions.
- Government School (Kichwele Street) on 51 occasions.

ANALYSIS OF FINDINGS OF MOSQUITO LARVÆ IN DAR-ES-SALAAM TOWNSHIP, 1928.

Month.					Rainfall in inches.	Anopheline.	Culex.	Stegomyia.
January	..	..	..	..	1.435	18	53	212
February	..	..	..	..	0.540	4	9	62
March	..	..	..	..	3.776	6	22	103
April	..	..	..	..	12.505	30	71	139
May	..	..	..	..	6.331	142	159	279
June	..	..	..	..	5.378	56	167	121
July	..	..	..	..	0.250	11	72	55
August	..	..	..	..	1.816	8	57	76
September	..	..	..	..	0.408	4	26	96
October	..	..	..	..	0.050	4	36	52
November	..	..	..	..	4.402	—	31	86
December	..	..	..	..	0.774	1	12	55
TOTAL	..	..	..	..	37.665	284	715	1,336

COMPARATIVE TABLE OF ARTIFICIAL MOSQUITO BREEDING PLACES, DAR-ES-SALAAM
TOWNSHIP, 1928.

	Anopheles.			Culex.			Stegomyia.		
	1926.	1927.	1928.	1926.	1927.	1928.	1926.	1927.	1928.
Tins and rubbish	—	—	1	18	29	37	122	149	185
Jars	—	—	1	14	11	12	221	128	240
Flower pots, etc.	—	—	—	—	2	1	—	15	15
Drums and barrels	—	—	2	50	27	45	564	352	650
Roof—tanks and gutters	—	—	—	1	2	—	7	1	11
Unclassified iron containers	—	—	25	22	9	27	150	69	137
Defective structure	—	1	1	—	13	1	—	—	—
Excavations and borrow-pits	—	3	37	2	3	44	5	—	—
Dhows (water containers)	—	—	—	—	—	—	3	7	4
Tanks	—	1	3	31	20	16	178	150	73
Drains	—	2	4	13	20	48	6	2	3
Pools	—	17	46	70	30	67	6	3	9
*Soakage pits and cess pits	*3	—	*4	121	82	105	2	3	1
Wells	1	—	—	2	4	9	1	2	3
Gully traps	—	—	1	63	50	120	—	9	5
Flushing cisterns	—	—	—	—	—	—	—	—	—

* Under construction.

The greatest number of *Stegomyia* larvæ (650) was found in drums and barrels.

The greatest number of *Culex* larvæ (105) was found in soakage and cesspits.

The greatest number of *Anopheles* larvæ (46) was found in pools.

The chief recorded breeding places of Anophelines were :—

	1926.	1927.	1928.
1. Dockyard, Kurasini. Seven creeks containing fresh water springs	123	4	19
2. Gerezani Valley	105	1	67
3. Town (swampy places, road, pools and surface drains) within the actual Township regularly searched by a special man	48	14	46
4. Msimbazi Valley	28	6	27
5. Town (casual finds by sectional inspectors)	55	19	125
	359	44	284

Malaria.—Comparative table of notifications for Malaria, 1924–28 :—

Year.	Confirmed.	Not confirmed.	Total Notifications.	Percentage confirmed.
1924	520	180	700	74
1925	742	390	1,132	65
1926	359	320	679	52
1927	961	3,310	4,271	22
1928	1,585	5,869	7,454	21·26

NOTES.—Figures for 1926 do not include notifications from Sewa Hadji Hospital (Native and Asiatics).

Percentages of Confirmed Cases :—

European Hospital	78·92
Private Practitioners	7·63
Health Office	100·00
Sewa Hadji Hospital	*19·20

* Not reliable.

Almost double the number of cases for 1927 were notified by the Sewa Hadji Hospital and private practitioners for 1928. A very small percentage of these cases, however, was microscopically confirmed. The European Hospital Statistics, *i.e.*, 307 cases for 1927 and 370 cases for 1928, 80 per cent. of which were confirmed, provide a truer index.

The large total increase is no doubt partly due to the increased number of private practitioners in the town. It is to be regretted that the latter, in spite of repeated requests from this office, do not take advantage of laboratory facilities to have their cases microscopically confirmed.

Anti-Anopheline Work.

The very heavy rains, unusual for the time of the year, which occurred during the last quarter of 1927, caused many new seepage areas to appear in hitherto dry situations, thereby increasing the already heavy work of the drainage gang. The rains during the early part of 1928, though not abnormally heavy, were spread more or less evenly over the period from March to June, thus maintaining ideal conditions for the breeding of Anopheline mosquitoes. The raising of the sub-soil water level necessitated the cutting of nearly $3\frac{1}{2}$ miles of new drainage ditches, thereby increasing the heavy maintenance charge already being borne by the Health Department. The total length of open drainage ditches now being maintained is approximately 25 miles, about two-thirds of which total contain water all the year round. The major portion of this drainage system is cut through loose sandy soil, and much erosion and silting takes place after every heavy shower, frequent regrading being necessary to maintain a suitable flow. A complete survey of the system is being prepared by Mr. Rance, and will be completed during 1929.

All drains were cleared at 10-day intervals, and swamps and seepage areas cleared as often as labour became available. Routine oiling was carried on as in previous years, but owing to shortage of staff, could not be given the amount of direct supervision necessary for its successful application. Filling operations were carried on throughout the year, a total of 13,085 cubic yards of earth being filled into depressions and swamps. During the latter months of the year several swamps formed by seepage were drained. Particulars of the two more important ones are given below. Owing to the high cost of pipes and the scarcity of stones available for tile drainage "makumbis" were used whenever possible and, up to the present, appear to have been successful.

Gerezani Creek.

Filling was continued on the south-eastern side of the pool, and this part of the work is now nearing completion. During the month of August seepage was discovered on the north-western side of the creek, just below the new quarters being built by the Tanganyika Railways for occupation by European staff. The whole area was immediately cleared and an extensive swamp exposed. This swamp was under-drained, and "piped" contour drains were put in at the foot of the cliff, a total of 640 yards of pipes being laid. These measures were successful, the swamp disappearing four days thereafter. A sum of £20 was allotted by the Chief Engineer Railways, to assist in this work.

Ahmed Abedi's Shamba (a branch of Msimbazi Creek).

Owing to the heavy numbers of adult anophelines being constantly caught in the Government School, a special survey of the district was carried out and extensive swamps were discovered in the above-mentioned shamba. They were cleared of grass, and it was decided that contour drains would be the best method of drainage. The work has been commenced, and a system of under-drainage carried out to assist in the immediate drying out of the swamps. "Makumbis" were used in all the drains, except one carrying a heavy volume of water in which 3-inch agricultural pipes were used. The two swamps already handled dried out within a week and work is still proceeding on the remainder. A

DETAILED ANALYSIS OF MALARIA NOTIFICATIONS, HEALTH OFFICE, DAR-ES-SALAAM, 1928.

Month.	Medical Officer i/c European Hospital.				Private Practitioners.				Health Office.				Sewa Hadji Hospital.				Total Cases.			Outside Infections.		B.W.F.	
	Confirmed.		Not Confirmed.		Confirmed.		Not Confirmed.		Confirmed.		Not Confirmed.		Confirmed.		Not Confirmed.		Confirmed.	Not Confirmed.	Notified.			Europeans.	Asiatic and Natives.
	S.T.	B.T.	Q.		S.T.	B.T.	Q.		S.T.	B.T.	Q.		S.T.	B.T.	Not stated								
January ..	36	1	—	17	8	—	—	86	1	—	—	—	—	—	82	350	128	453	581	4	—	1	1
February ..	21	2	1	6	5	1	—	52	2	—	—	—	—	—	95	438	127	496	623	5	—	1	2
March ..	11	—	—	4	13	—	—	53	3	—	—	—	—	—	72	290	99	347	446	5	—	—	2
April ..	14	—	—	4	1	—	—	45	2	—	—	—	—	—	89	315	106	364	470	4	—	—	1
May ..	45	—	—	4	4	—	—	98	4	—	—	—	—	—	158	595	211	697	908	11	—	—	1
June ..	66	1	—	3	15	1	—	165	3	—	—	—	—	—	127	622	213	790	1,003	7	2	1	1
July ..	36	1	—	—	7	—	—	86	4	—	—	—	—	—	117	484	165	570	735	4	—	—	1
August ..	14	—	—	13	2	—	—	52	1	—	—	—	—	—	120	372	137	437	574	5	—	—	—
September ..	8	1	—	10	—	—	—	16	2	—	—	—	—	—	134	360	145	386	531	—	1	1	1
October ..	6	1	—	9	1	—	—	27	2	—	—	—	—	—	62	394	72	430	502	3	—	—	—
November ..	16	—	—	5	2	—	—	27	4	—	—	—	—	—	87	422	109	454	563	3	—	—	—
December ..	11	—	—	3	—	—	—	19	1	—	—	—	—	61	—	423	73	445	518	5	—	—	—
TOTAL ..	284	7	1	78	58	2	—	726	29	—	—	—	61	—	1,143	5,065	1,585	5,869	7,454	56	5	5	10

summary of the work carried out by the Public Health Department Drainage Gang during 1928 is given below :—

SUMMARY OF WORK PERFORMED BY THE PUBLIC HEALTH DEPARTMENT DRAINERS DURING 1928.

Month.	Nature of Work.					
	Drain cleaning.	New drains cut.	Grass cut.	Filling done.	Tiled drains laid.	French drains laid.
	Yards.	Yards.	Sq. yards.	Cub. yards.	Yards.	Yards.
January ..	128,575	188	327,997	551	—	—
February ..	128,236	228	309,288	709	—	—
March ..	126,627	784	218,329	900	—	—
April ..	127,479	291	104,041	400	—	—
May ..	159,367	1,010	220,910	840	—	—
June ..	127,518	831	71,124	1,328	—	—
July ..	85,733	1,088	133,843	980	—	—
August ..	148,044	158	568,359	1,082	—	—
September ..	122,071	69	418,696	1,800	72	—
October ..	132,810	201	311,859	1,081	250	50
November ..	127,463	530	304,318	1,661	426	104
December ..	114,863	656	419,898	1,753	252	410
TOTAL ..	1,519,786	6,034	3,408,662	13,085	1,000	564

OTHER ARTHROPOD-BORNE DISEASES.

Plague.—No cases notified.

							Rats caught.	Rats examined, Laboratory.
1926	..	..	..	..	..	..	19,671	3,915
1927	..	..	..	..	..	..	19,217	3,650
1928	..	..	..	..	..	..	11,487	2,095

Relapsing Fever.—

Cases notified by—

The Medical Officer, European Hospital	..	..	..	..	—
The Medical Officer, Sewa Hadji Hospital	..	..	..	..	17
The Medical Officer of Health	..	..	..	..	7
Other Practitioners	..	..	..	..	1
TOTAL	..	..	..	..	25

All except one occurred before June. Only in one case were ticks found in the house of an infected Dar-es-Salaam resident, at 42, Kirk Street.

One ornithodoros moubata was found in the Police Lines on 8th May, 1928, but no cases of relapsing fever occurred there.

Six only of those notified had been continually resident in Dar-es-Salaam for over a year.

8 had been to Tukuyu, *via* Iringa.

3 „ „ Dodoma.

2 „ „ Mahenge.

1 „ „ Songea.

1 „ „ Morogoro.

4 „ „ Shambas, unstated.

OTHER INFECTIVE DISEASES NOTIFIED.

Notified by	Chicken Pox.	Mumps.	Measles.	Leprosy.	Tuberculosis.	C.S.M.	Typhoid.	Anthrax.	Whooping Cough.	Beri-beri.	Sleeping Sickness.
Medical Officer, European Hospital	—	—	—	—	11	—	4	1	—	—	—
Medical Officer, Sewa Hadji Hospital	10	2	4	4	45	2	1	—	2	1	1
Medical Officer of Health	10	1	1	62	44	—	—	—	1	—	—
Private Practitioners	—	—	1	—	8	—	—	—	—	—	1
TOTAL	20	3	6	66	108	2	5	1	3	1	2

No cases of plague, small-pox, influenza, cholera, diphtheria, scarlatina nor dysentery were notified.

Two cases of cerebro-spinal meningitis were notified from the Sewa Hadji Hospital. Both had been resident in Dar-es-Salaam. Disinfection of houses concerned and inspection of contacts was carried out.

Of the typhoid cases, four were Europeans and, with one exception, were infected outside Dar-es-Salaam.

The two cases of sleeping sickness were notified in Dar-es-Salaam, one, a native sailor from the Belgian Congo, of the s.s. "Katanga," and the other, a native Veterinary Guard who came from Shinyanga. Both showed trypanosomes in the blood and were admitted to the infectious diseases hospital—and treated with courses of Bayer 205 and tryparsamide. After about five months they were discharged, greatly improved and apparently perfectly well. No trypanosomes were detected on blood examination after the first month.

The case of anthrax occurred in a European employee of a local hide factor. He was probably infected at his work, which included the handling of hides. He was treated at the European Hospital. The pustule on his wrist showed *B. anthracis* microscopically. He recovered.

The case of beri-beri was a native of Mafia. He had been resident in Dar-es-Salaam for two years. The case was notified by and treated at the Sewa Hadji Hospital.

550 pathological specimens were sent to the Laboratory from Health Office, Government School, Infectious Diseases Hospital and Child Welfare Clinic, as follows:—

- 157 Sputa for examination for T.B.
- 169 Nasal scrapings for examination for Leprosy.
- 59 Skin scrapings for examination for Leprosy.
- 118 Blood specimens for Malaria and Wasserman Reaction.
- 14 Fæces.
- 19 Urines.
- 14 Others.

550 Total.

Leprosy.—Early cases of leprosy were treated in the Infectious Diseases Hospital, the majority by weekly subcutaneous injections of Hydnocreol 5–10 c.c., the more resistant cases being treated with Intravenous Moogrol in doses of 1–5 c.c., weekly. Almost all under treatment have greatly improved; only one case of acute leprotic fever having occurred in a patient under Moogrol treatment. Cases were discharged when nasal mucosal smears failed to show the bacillus lepræ on three successive occasions and clinical symptoms had disappeared. Of the patients discharged during 1928, four are known to be at work, seven are receiving weekly injections as out-patients, and five

have voluntarily returned to Nunge after a short period of freedom. The Nunge buildings are now in a very bad state of repair, the new building expected not having been erected yet. The majority of the patients have erected native huts of their own near the main buildings. There is still difficulty with the water supply, and water has to be carried about half-a-mile from the three wells close to the creek, by the stronger members of the community. Gifts have been received from Mr. Mathew (twice), Mrs. Williams, and others, most of which have been for the provision of clothing for the patients.

RETURN OF LEPROSY PATIENTS FOR 1928.

	Nunge.	I.D.H.
Inmates on 1.1.28	64	31
Admitted during 1928	20	65
Discharged	4*	41†
Died	9	—
Absconded	6	25
Remaining on 31.12.28	65	30

* Two to the Infectious Diseases Hospital.

† Eight to Nunge.

Tuberculosis.—The number of cases of this disease notified, 108, is greater than that of last year, chiefly owing to the activities of the Health Office African staff, who notified suspicious cases to the Medical Officer. In all cases where it is thought that the patient cannot be efficiently treated at home, patients are isolated in the Infectious Diseases Hospital, where open air, good food and medicinal treatment are given. Despite this, the great majority of Africans rapidly succumb to the disease, and only 8 out of 75 admissions were discharged as having the disease arrested. Those who wished to return to homes outside the Dar-es-Salaam area, provided they were fit to travel, were given permission to do so, and the Medical Officer of Health of their district was notified. They were instructed in personal hygiene and the use of spittoons, while in hospital.

TUBERCULOSIS.

	Europeans.	Asiatic.	Africans.	Total.
Notified 1928	4	26	77	107
Admitted to the Infectious Diseases Hospital, 1928	—	4	71	75
Infectious Diseases Hospital on 1.1.28	—	—	5	5
Died in Infectious Diseases Hospital	—	—	28	28
Repatriated	1	1	11	13
Discharged from the Infectious Diseases Hospital with Disease arrested	—	1	7	8
Absconded from the Infectious Diseases Hospital	—	1	24	25

INFECTIOUS DISEASES HOSPITAL.

The new wards for phthisis cases were completed during the year. The erection of the Washington Lyon disinfector was completed, and it is now in working order. Six new large Makuti huts for lepers were erected in place of the three old ones. The new fence has been erected and makes the hospital much more efficient as an isolation hospital. Abscondence still occurs, but the practice of some patients of going out regularly into the town during the day has stopped. Electric light was installed in the more permanent buildings in December. The staff has been increased by two orderlies and three pump boys.

SUMMARY OF HOSPITAL FIGURES FOR THE YEAR 1928.

Disease.	Remaining 1.1.1928.	Admitted.	Dis- charged.	Died.	Absconded.	Remaining 31.12.28.
Leprosy	31	65	41	—	25	30
Tuberculosis	5	75	19*	28	25	8
Measles	—	6	6	—	—	—
Chicken-pox	—	26	26	—	—	—
Relapsing fever.. .. .	—	7	7	—	—	—
Influenza	—	—	—	—	—	—
Sleeping Sickness	—	2	2	—	—	—
Whooping Cough	—	2	2	—	—	—
Mumps	—	3	2	—	1	—
Meningitis C.S.M. and Pneumococcal	—	3	—	3	—	—
Other non-infectious cases	—	3	1	2	—	—
TOTAL.. .. .	36	192	106	33	51	38

* 11 were repatriated with disease still active.

VACCINATIONS.

These were performed principally at the Health Office and on board ships, and mainly on travellers, hence many could not be re-inspected. A number of vaccinations was also carried out at outstations in charge of African District Sanitary Inspectors and at the Government School, K.A.R. and Police Lines. 3,511 vaccinations in all were performed—58 per cent. of these were re-inspected and 58 per cent. of the re-inspected were found successful.

Total Number—	1926.	1927.	1928.
Vaccinated	1,021	415	3,511
Re-inspected	96	4	2,039
Successful	55	3	1,182
Unsuccessful	41	1	857
Not re-inspected	925	411	1,472

PORT HEALTH WORK.

The number of vessels cleared from this port is gradually increasing, as is shown by the following statement :—

	1926.	1927.	1928.
Ships cleared	361	480	558
Dhows cleared	974	1,738	2,290

In June, the new and larger motor boat, specially constructed by the Dockyard, was put into use, and has proved very satisfactory.

No ships were reported on arrival as having had a case of major infectious disease on board, but three cases of chicken-pox, one case of measles, and three of pulmonary tuberculosis were removed to the Infectious Diseases Hospital from among the immigrants inspected.

GENERAL MEASURES OF SANITATION.

Public Conveniences.—Five new conveniences of modern type have been opened in the town during the year, two of a purely public nature and three serving blocks of quarters in the residential area. These new latrines have improved conditions considerably by doing away with three unsatisfactory dry pan latrines and an antiquated trough system.

The new market latrines are also to be reconstructed by substituting proper pans and squatting plates for short hopper pans and trough arrangements at present existing.

Dry pan latrines still to be dealt with are to be found at Kikukoni, the agricultural headquarter building, and at the Dhobie Station. An area badly served with regard to native latrine accommodation also exists in Upanga.

The wharf and customs zone, although greatly improved as to European accommodation, leaves much to be desired with regard to native conveniences, two very objectionable native latrines existing which require urgent attention.

Sewage Disposal.—In the residential zone practically all houses are drained to cesspits, many of which require to be emptied periodically; while in the commercial area sewers discharging into the harbour are being increasingly made use of in addition to cesspits. Three tanks, each of 400 gallons capacity and mounted on motor chassis, are employed for emptying the cesspits. A new motor pump which acts very efficiently was also available during the year; 7,233 loads of cess were thus disposed of. The loads are emptied into outfall sewers at two points along the sea front and harbour respectively. The Garden Avenue—Smuts Street area—particularly has been the cause of numerous complaints with regard to the overflowing of cesspits, and during the wet weather it is impossible to deal effectively with the sewage at this point. Nuisance arises, which renders the houses concerned almost uninhabitable. The Public Works Department are at present endeavouring to lay a sewer along Smuts Street and discharging into the harbour, which it is hoped will be available for the drainage from these quarters. The work, however, appears to present considerable difficulty, and it is feared that this sewer will not be completed before the next wet season sets in.

During the year a survey of all existing sewers with their house and surface-water drain connection, was carried out, and a plan prepared by Mr. Hume, Sanitary Superintendent. This matter was incorporated in the very able report rendered by Dr. Scott in accordance with the Honourable the Chief Secretary's request for a report on the drainage of Dar-es-Salaam.

Revenue received for the emptying of non-Government cesspits amounted to £332 10s., as compared with £276 for 1927.

Refuse Collection and Disposal.—There are at present 10 ox carts and 2 motor lorries used to collect and transport household refuse to the incinerators at Amani Street, where the refuse is burnt in open field type incinerators; the resultant ash being used to fill in low-lying ground adjoining Amani Street. There has also been a motor lorry available for the collection of garden refuse, grass, hedge trimmings, etc., from roadsides throughout the town. This refuse is burnt and used to fill in a low-lying area in Upanga. This establishment of transport is unable to cope satisfactorily with the amount of refuse requiring collection and disposal.

During the month of December three additional motor lorries were kindly loaned by the Transport Department to assist in this work, while a special sum of money had to be provided in order to procure labour and transport for the clearing away of many unsightly accumulations of building materials, scrap heaps, etc., which had for years been an eyesore in various parts of the township.

The erection of the new destructor to be built at the top of Bagamoyo Street has not yet been commenced.

26,878½ cart loads of household refuse, and 8,422 loads of garden refuse, etc., were collected and dealt with during the year.

SANITARY LABOUR.

The labour is divided into two sections: (1) *Anti-mosquito Labour*, consisting of approximately 30 mosquito finders and 50 drainers, and (2) *General Sanitary Labourers* of 200 men, subdivided into three gangs on road-sweeping throughout the town, and two gangs on general duty, e.g., refuse collection and disposal, cleansing and supervision of public latrines, hedge cutting, grass cutting on roadsides and open spaces, upkeep of cemeteries, cesspit emptying, etc.

During the year under review, owing to the scattered nature of the duties of sanitary squads and the lack of adequate European supervision, it was found necessary to detail one of the Health Office Asiatic clerks, Mr. Nanayakkara, for part-time duty as labour supervisor. This measure, no doubt, has added to the efficiency of all labour. The cesspit emptying work has increased to such an extent that an African Urban Sanitary Inspector is now in charge of this section, where formerly a head boy sufficed.

Cemeteries.—Five public cemeteries were maintained in a sanitary condition during the year. Arrangements are being made for the numbering of graves at the General European Cemetery, Upanga Road; German Cemetery, Ocean Road; and the Native Christian Cemetery at Pugu Road.

The need for horticultural supervision of these cemeteries is emphasized, as the Health Department staff do not possess the requisite knowledge to perform this work satisfactorily, with the result that portions of these cemeteries are apt to appear neglected.

Fifty-one burials, including 4 European, 1 Asiatic and 46 Native, were performed by the Health Department staff during the year.

Revenue received by the Department for European and Asiatic burials, shs. 100/-.

FOOD INSPECTION.

Description of articles surrendered for destruction during the year 1928.

Description.	Lots.	Quantity.
Ox beef	151	2,032 lb.
Goat flesh	20	95½ "
Ox hearts	3	8 "
„ liver	4	16½ "
„ kidneys	6	16 "
„ brains	6	4 "
Goat offal	2	24 "
Fresh fish	7	157 "
Dried fish	2	74 "
Bacon	1	28 "
Hams, whole	1	21½ "
„ tinned	1	112½ "
Fresh fruit	7	1,412 "
Dried fruit	4	1,722 "
Tinned milk	19	3,836 tins.
„ foods	19	429 "
Bottled foods	1	89 bottles.
Confectionery	5	135 packets.
Cheese, tinned	4	180 tins.
Cheese	3	96 lb.
Cereal	1	1 packet.
Rice	4	282 lb.
Mealie meal	8	26,390 "
Flour	2	252 "
Bread	2	37 "

Number of Food Samples sent for analysis :—

Article.	No.	Result.
Milk	50	47 genuine; average fat content, 4·7.
Soda-water, bottles	10	5 good, 2 <i>B. Coli</i> , 3 lactose fermenters.
Filtered water	6	3 good, 3 <i>B. Coli</i> .
Distilled water	1	1 good.
Ghee	2	2 "
Butter	1	1 "
Coffee	1	1 "
Mealie meal	1	1 not fresh, but no adulteration.

GENERAL SUMMARY OF LICENSED AND OFFENSIVE TRADES.

Premises requiring licences :—

	No. licensed.
Eating houses	19
Aerated water manufacturers	5
Ice manufacturers	3
Cooling drinks	21
Milk shops	7
Bakeries	6
Laundries	17
Cowsheds	30

Premises requiring permits :—

	Permits issued
Soap boiler	4
Ghee manufacturers	—
Hide factors	5
Camel oil mills	—

Markets.—The markets were visited regularly by the Food Inspector for purpose of examining food exposed for sale and supervision of cleanliness. The actual work of keeping the markets clean is carried out by the Administrative Department. It is questionable as to whether this is a suitable arrangement, and it would possibly be better if the labourers and stall-holders concerned came directly under orders from the Food Inspector with regard to the maintenance of general cleanliness. It is hoped to have the new market repainted and reglazed during next financial year. The old market which is used for eating houses and for the sale of milk is in a most dilapidated condition. The Township Authority have applied for funds for the reconstruction of this market.

Milk Shops.—There are seven licensed shops. An endeavour has been made to have all utensils scalded before returning to the Shambas. Three sellers were warned for selling milk deficient in fat.

Milk Sheds.—These are outside the Township, and with few exceptions, the method of milking, cleansing and storing of utensils is of a primitive order. A sum of money has been allotted by Government for the erection of a municipal milking shed during the present financial year, and a site has been approved on the Gerezani Creek in the near vicinity of the largest group of cow owners in the Kheko area.

Eating Houses.—There are nineteen eating houses licensed in addition to those at the public market. A considerable improvement with regard to the sanitary conditions of these premises was evident during the year.

Bakehouses.—There are six licensed bakeries. A great deal of attention is necessary to keep these places up to a decent standard, as also to regulate the unheard-of places where at times bread is stored and sold. On two occasions a European baker was prosecuted for conducting a bakery without a licence.

Aerated Water, Ice, etc.—There are five aerated water manufacturers licensed, three of whom also manufacture ice. These premises were maintained in a satisfactory condition. Three manufacturers were warned for neglect of filters and washing arrangements.

Cold Drink Shops.—There are twenty-one shops licensed, mainly of the one-room or verandah type. The washing arrangements in some cases are of a very unsatisfactory nature, *i.e.*, consisting of a bath, with a tap for the water, and a basin for the reception of dirty water, which is usually emptied out on to the street. Proper washing arrangements, drainage and sitting accommodation were insisted upon for all new licences, and it is hoped that a general improvement will be manifest in the near future.

Soap Factories.—Existing soap factories are being allowed to remain within the Township provided that no public nuisance arises, *e.g.*, by the use of animal fats, etc. All new factories must be erected on the offensive factory sites on the outskirts of the town.

Hide Factors.—Hide godowns are all being removed to the offensive factory sites on 1st April, 1929.

Laundries.—All washing by licensed dhobies is done at the public washing-place at Gerezani Creek, while ironing is carried out at their own premises. The public washing-place is in a most unsatisfactory condition, and the Township Authority have applied for a sum of money to renovate the place and provide a water supply from the main. This will probably be done next year.

Street Hawkers.—A large number of these hawkers have been allowed to sell prepared foodstuffs in the streets. This trade requires more regulation than hitherto brought into

operation, as in many cases food is exposed to contamination from flies and from dirt and dust blowing about the street. An attempt was made during the year to enforce Township Rule 86 with regard to the procuring of a permit in each case from the Administrative Department and to take precautions respecting the covering of foodstuffs.

WATER SUPPLY.

Main P.W.D. Supply.—A new well and borehole is in the course of construction at Gerezani, which should add materially to the town supply.

Three other boreholes were sunk during the year, and a new pumping station erected at Gerezani.

Three new mains were laid on, supplying Swahili, Msimbazi, Wanyamwezi, Pemba, Jangwani and Kichwele Streets and Garden Avenue.

The consumption from the mains was $54\frac{1}{2}$ million gallons, as compared with 38,128,560 gallons for 1927.

Number of buildings supplied from mains :—

1924	..	..	..	..	..	..	..	..	..	145
1925	..	..	..	..	..	..	..	..	..	168
1926	..	..	..	..	..	..	..	..	..	211
1927	..	..	..	..	..	..	..	..	..	385
1928	..	..	..	..	..	..	..	..	..	469

Cost of water to consumers :—

		1927.	1928.
On flat rate	.. .. .	Shs. 15/- per mensem ..	Shs. 8/- to 22/- according to salary of official.
By meter	.. .. .	Shs. 5/- per 1,000 gallons	Shs. 3/33.
At standpipes	.. .. .	Two cents per 4-gallon tin	One cent.

Expenditure and Revenue on P.W.R. water supply, January to December, 1928—

	£	s.	d.
Expenditure	2,882	11	4
Revenue	7,036	3	8

Expenditure on P.W.E. Improvements and Extension to water supply—

	£	s.	d.
January to December, 1928	3,787	1	6

Other Sources.—A survey of existing shallow wells throughout the Township is in progress, and samples of water are being taken from all sources for analysis, including bacteriological examination.

GENERAL SANITATION AND HOUSING.

This subject has been dealt with elsewhere in the report, but conditions in the commercial zone of the Township require special mention. A good deal of reconstruction and erecting of new buildings is going on in this area and vacant plots are gradually being occupied; but the problem of clearing up certain objectionable areas, notably in India Street, Market Street and Bagamoyo Street districts, has still to be faced. Here the plots are nearly all overbuilt, the houses overcrowded, and sanitary arrangements of the most primitive type. Progress is being made slowly, and every means is taken to induce owners to build or reconstruct on modern lines.

A new housing scheme for European Government officials was commenced towards the end of the year, provision being made for the erection of eleven houses by the Public Works Department at Sea-point.

Three Government quarters were erected by the Public Works Department during the year, and 18 houses by the Railway Department (10 European, 8 Asiatic).

OFFICE AND STORE ACCOMMODATION.

The present accommodation being inadequate for both Health Office and Township Authority work, it is proposed to move to the more commodious premises in Acacia Avenue owned by Government and popularly known as the "Nyumba ya Mayayi." A sum of £700, as estimated by the Public Works Department, would be required to render the building suitable for the purpose intended and to reconstruct the sanitary arrangements on modern lines, the latter measure in any case being an immediate necessity.

SUMMARY OF OTHER ROUTINE SANITARY WORK FOR THE YEAR 1928.

1. House to house inspections	108,625
2. Nuisances dealt with	546
3. Drains inspected	64,658
" oiled	33,695
4. Cesspits and Soakage pits inspected	122,208
" oiled	22,007
5. Pools inspected	12,953
" oiled	12,791
6. Wells inspected	12,832
" oiled	2,445
7. Tanks and Barrels inspected	218,098
" oiled	301
8. Collections of fly maggots found	76
9. Notices served	277
10. Prosecutions	11

RETURN OF RAINFALL FOR THE YEAR 1928 (AS RECORDED AT THE HEALTH OFFICE).

Month.	Total fall for the month.	Highest fall in one day.	Date of highest fall.	Number of days on which rain fell.	Total fallen to date at end of month.
	Inches.	Inches.			Inches.
January	1.435	0.530	9th	6 + 2 showers	1.435
February	0.540	0.400	29th	2 + 5 "	1.975
March	3.776	1.490	25th	10 + 5 "	5.751
April	12.505	3.750	3rd	19 + 1 "	18.256
May	6.331	2.080	4th	14	24.587
June	5.378	1.530	2nd	8	29.965
July	0.250	0.250	23rd	1 + 6 "	30.215
August	1.816	0.940	21st	4 + 2 "	32.031
September	0.408	0.112	27th	6 + 2 "	32.439
October	0.050	0.050	6th	1	32.489
November	4.402	1.500	10th	20	36.891
December	0.774	0.188	5th	11 + 3 "	37.665
TOTAL	37.665	—	—	102 + 26 showers	—

STATEMENT SHOWING REVENUE RECEIVED BY THE HEALTH OFFICE, DAR-ES-SALAAM, DURING THE YEAR 1928.

	Shs.
Cesspit emptying fees (non-Government houses)	6,650.00
Fees for digging graves (European and Asiatic)	100.00
Sale of oxen	43.20
Infectious Diseases Hospital fees	81.00
TOTAL	6,874.20

TOWNSHIP AUTHORITY, 1928.

No unusual events occurred during the year under review which call for comment. It will be seen by the figures submitted relating to the number of plans approved by the Township Authority, and their comparison with corresponding figures supplied in the past, that building activities are steadily increasing.

It may be mentioned that this is one of the factors which led the Authority to apply for the appointment of an Executive Officer, an officer who could devote the whole of his time to Township Authority duties.

Considerable discussion took place in the course of the year relating to the urgent need for residential plots for Natives; more especially for those Natives who are at present residing in dilapidated huts in the open space and who are required to remove in accordance with the demolition notices served upon them.

Closely allied to this question was the proposed establishment of a Native labour camp in or near Dar-es-Salaam. Difficulty arose as to a suitable site for the purpose, and the question was left in abeyance pending a definite decision being arrived at as regards its ultimate situation.

Street lighting was a matter which received the Authority's attention, and suggestions were put forward for the more efficient electric lighting of streets in the Township.

Considerable attention was given to the general sanitary appearance of the town, more especially in regard to the various unsightly dumps, particularly of building of refuse in different areas, some of which had been in existence for many years. The Authority were successful in procuring a sum of £50 to enable these refuse dumps to be removed and disposed of.

Towards the end of the year, a petition from the Builders and Architects in the Township was received, asking if the existing Technical Sections of the Building Rules could be amended. The Authority were fully in agreement with the proposed modification of the building sections of the amended Rules, and in December an informal Committee of technical officers was formed to consider the proposals put forward by the builders and architects, and early in the year 1929 their report was published for consideration.

SUMMARY OF TOWNSHIP AUTHORITY WORK, 1928.

Number of formal notices served	..	..	..	..	40
„ prosecutions	..	..	..	..	10
„ plans passed	..	..	..	..	226*
„ choos dug	..	..	..	..	2,060
„ permits for repairing Native houses issued	..	..	..	..	238
„ Native houses erected	..	..	..	..	57
Total number of Native houses completed during 1928	..	..	..	..	80
Number of premises in residential and commercial zones passed for occupation	..	..	..	..	58

* 1927—127 plans passed.

DAR-ES-SALAAM DISTRICT.

SUMMARY OF DISTRICT SANITATION REPORTS FOR THE YEAR 1928.

District.	Popula- tion.	No. of Huts.	Latrines Dug.	Births.		Deaths.		
				Male.	Female.	Male.	Female.	Children.
Vikindu	13,903	4,261	3,784	96	103	92	75	70
Dutumi	4,360	1,288	1,422	40	45	7	10	12
Masaki	11,653	3,079	3,310	121	155	43	32	55
Kimbiji	9,887	2,407	1,832	8	16	29	27	35
Pugu	12,190	3,681	3,015	48	69	41	32	31
Kisiju	12,291	5,383	3,825	293	392	116	98	119
Maneromango	12,593	4,158	3,473	45	42	50	28	—
Ruvu	7,846	3,189	2,356	28	38	20	22	18
Kissangire	24,475	14,283	1,423	51	51	42	42	61
Dar-es-Salaam boundaries	753	245	140	—	—	—	—	—
Mafia	2,570	1,080	829	18	9	15	11	2
TOTAL	112,521	43,054	25,409	748	920	455	377	403

The districts of Ruvu, Pugu, Vikindu and Mboamaji were also inspected by African Urban Sanitary Inspector Addison, no European Officer being available for the supervision of this work during the year.

No outbreaks of infectious disease occurred, with the exception of three sporadic cases of chickenpox at Vikindu, where preventive measures were carried out.

A number of vaccinations, included in the general return, were performed.

Two candidates were given practical instruction in the duties of African District Sanitary Inspector.

VITAL STATISTICS, 1928, DAR-ES-SALAAM.
(Prepared by Dr. Madeleine Harvey Clarke.)

	Europeans.			Africans.			Asiatics, including Syrians.			Total.
	Males.	Females.	Total.	Males.	Females.	Total.	Males.	Females.	Total.	
1928. Population figures supplied by District Officer*—										
Civilian	681	370	1,051	12,791	9,139	21,930	4,300	1,800	6,100	29,081
K.A.R. and Police	—	—	—	857	453	1,310	—	—	—	1,310
Total population from census figures			1,051			23,240			6,100	30,391
1927. Population estimated by Dis- trict Officer—										
Civilian		774			28,464			5,900		35,138
K.A.R. and Police		—			1,536			—		1,536
TOTAL		774			30,000			5,900		36,674
1926. . Population estimated by Dis- trict Officer—										
Civilian		900			30,000			6,000		36,900
K.A.R. and Police		—			1,235			—		1,235
TOTAL		900			31,235			6,000		38,135
1928. Births notified at Health Office—										
1928		28			(69)†			(75)†		(172)
1927		22			(53)			(37)		(112)
1926		16			(44)			(26)		(86)
1928. Deaths for which Burial Per- mits were issued—										
1928		13			373			147		533
1927		13			324			122		459
1926		7			375			136		518
1928. Infant Deaths—										
1928		—			35			54		89
1927		2			20			28		50
1928. Birth Rate—										
1928		26·6			2·97			12·2		5·65
1927		28·4			1·76			6·2		3·05
1928. Crude Death Rate—										
1928		23·37			16·02			11·70		17·57
1927		16·79			10·8			20·67		12·5
1926		7·7			12·0			22·66		13·6
1928. Infant Mortality Rate—										
1928		—			(507·2)			(720·0)		(518·5)
1927		45·5			(674)			(560)		(504)

* European population approximate (estimated) and Asiatic population unreliable (estimated).

† Notification not compulsory.

SUMMARY OF DEATHS.

Classified as Certified when seen by a Medical Practitioner before death or certified by post-mortem.

Classified as Notified when probable cause of death ascertained by inquiry after death.

—						Certified.			Notified.			Total.		
						1926.	1927.	1928.	1926.	1927.	1928.	1926.	1927.	1928.
Europeans	..	..	..	..	..	6	13	13	1	—	—	7	13	13
Africans	..	..	..	..	..	130	115	160	245	209	213	375	324	373
Asiatics	..	..	..	..	..	87	95	130	49	27	17	136	122	147
TOTAL	..	..	..	..	..	223	223	303	295	236	230	518	459	533

—		Certified.	Notified.	Total.
Males	.. ..	209	124	333
Females	.. ..	94	106	200
TOTAL	.. ..	303	230	533

TABLE SHOWING MONTHLY INCIDENCE OF DEATHS AND RAINFALL.

—						1927.		1928.	
						Rainfall.	Deaths.	Rainfall.	Deaths.
						Inches.		Inches.	
January	..	..	..	..	..	1·538	26	1·435	48
February	..	..	..	..	..	2·680	28	0·540	44
March	..	..	..	..	..	10·489	42	3·776	32
April	..	..	..	..	..	6·331	31	12·505	36
May	..	..	..	..	..	4·409	64	6·331	46
June	..	..	..	..	..	0·007	33	5·378	49
July	..	..	..	..	..	1·106	26	0·250	30
August	..	..	..	..	..	1·200	39	1·816	44
September	..	..	..	..	..	1·626	36	0·408	50
October	..	..	..	..	..	6·435	41	0·050	41
November	..	..	..	..	..	8·460	42	4·402	48
December	..	..	..	..	..	6·620	51	0·774	65
TOTAL	..	..	..	..	..	50·901	459	37·665	533

STILL-BIRTHS.

						1927.	1928.
Europeans	..	..	..	..	..	1	—
Africans	..	..	..	..	..	6	5
Asiatics	..	..	..	..	..	5	15
TOTAL	..	..	..	..	..	12	20

COMPARATIVE TABLE OF DEATHS BY COMMUNITIES, 1921-1928.

Year.	Rainfall in inches.	Europeans.		Asiatic.		African.		Total.	
		Deaths.	Crude Death Rate.	Deaths.	Crude Death Rate.	Deaths.	Crude Death Rate.	Deaths.	Crude Death Rate.
1921	33.9	7	—	52	—	170	—	229	—
1922	34.0	11	—	44	—	184	—	239	—
1923	25.6	8	—	79	—	237	—	325	—
1924	28.9	8	—	79	—	259	—	346	—
1925	42.0	4	6.0	124	26.9	304	13.2	432	15.4
1926	36.2	7	7.7	136	22.6	375	12.0	518	13.6
1927	50.9	13	16.79	123	20.67	324	10.8	459	12.5
1928	37.7	13	12.37	147	11.70	373	16.02	533	17.57

PRINCIPAL CAUSES OF DEATHS.

Disease.	Certified.	Notified.	Total.
" Homa "	—	127	127
Pneumonia and bronchitis	33	—	33
Pulmonary tuberculosis	30	—	30
" Tumbo "	—	30	30
Broncho-pneumonia	26	1	27
" Kifua "	—	25	25
Ankylostomiasis	24	—	24
Malaria	17	—	17
Injuries and accidents	15	2	17
Prematurity	8	5	13
Senility	4	9	13
Marasmus	12	1	13
Septicæmia and pyæmia	11	2	13
Infantile gastro-enteritis	11	1	12
Cerebral malaria	12	—	12
Nephritis	9	—	9
Malignant disease	6	1	7
Cerebral thrombosis hæmorrhage	4	1	5
Hernia (strang., and foll. op. for)	4	1	5
Tetanus	5	—	5
Valvular disease of heart	5	—	5
Infantile convulsions	3	1	4
Blackwater fever	4	—	4
Diabetes	4	—	4
Accidents of child-birth	3	1	4
Generalised tuberculosis	3	—	3
Toxæmia of pregnancy	2	1	3
Unknown	—	3	3
Puerperal sepsis	2	—	2
Typhoid fever	1	—	1
Others	—	—	60

CAUSES OF INFANT DEATHS.

	African.		Asiatic.		Total.
	Certified.	Notified.	Certified.	Notified.	
Prematurity	3	2	6	2	13
Pneumonia	3	—	9	1	13
Marasmus	6	—	4	—	10
Gastro-enteritis	3	—	7	—	10
Malaria	—	—	9	—	9
" Homa "	—	7	—	2	9
" Kifua "	—	5	—	—	5
" Tumbo "	—	5	—	—	5
Tetanus neonatorum	1	—	3	—	4
Convulsions	—	—	2	2	4
Icterus neon., malignant	—	—	2	—	2
Pleurisy	1	—	—	—	1
Exhaustion, prolonged labour	—	—	1	—	1
Nephritis	—	—	1	—	1
Pneumococcal Peritonitis	—	—	1	—	1
" Tegu " (? Cong. Syph.)	—	1	—	—	1
TOTAL	17	20	45	7	89

CAUSES OF DEATHS AMONG EUROPEANS.

1. Typhoid fever Source of infection not determined.
2. Poisoning —
3. Septicæmia Following wounds by lion.
4. Valvular disease of heart Complicating pregnancy: sudden cardiac failure.
5. Toxæmia of pregnancy —
6. Shock following operation Strangulated inguinal hernia.
7. Chronic Malaria and cardiac failure —
8. Tuberculosis of lungs Came from up-country.
9. Chronic Interstitial Nephritis —
10. Cerebral Malaria —
11. Blackwater fever —
12. " —
13. Cardiac syncope —

MATERNITY AND CHILD WELFARE IN DAR-ES-SALAAM.

BY MADELEINE HARVEY CLARKE, M.R.C.S. (Eng.), L.R.C.P., D.P.H. (Lond.), MEDICAL OFFICER IN CHARGE.

During the first two months of the year, the clinic was under the care of Miss B. G. Allardes, until her transfer to Kahama; for a month Miss K. P. Heckford acted as Health Visitor, until April, when Miss M. V. McIlroy took over the duties of Sister and Health Visitor. Since July, five newly-appointed Health Visitors have assisted at the clinic in order to acquire some knowledge of the language and the people before being transferred to other stations.

A summary of the work done during the past year is appended.

It will be seen that the work at the clinic has increased steadily since 1926; the house-to-house visiting is an important part of the work, and it is hoped that a second Health Visitor will be stationed here permanently so that this can be extended. Although since July the number of Health Visitors at the clinic has been three, with the exception of the Sister-in-Charge, all were newcomers to the territory, unable to speak the language, and thus lost much of their value if sent out to visit on their own, as so much depends on

knowing something of native customs and habits and being able to chat with the women. There has been little opportunity for the systematic training of native ayahs, and it is hoped that this important branch of maternity and child welfare work in this country will be developed during 1929.

One of the senior ayahs is now being trained for district work. At present she accompanies the Sister on her rounds, later on it is hoped she will be able to go alone, and eventually attend cases in the capacity of native midwife.

At the end of December, 1928, the staff was as follows :—

- 1 Medical Officer.
- 1 Sister and Health Visitor-in-Charge.
- 2 Sisters and Health Visitors.
- 2 Senior Native Ayahs.
- 4 Native Ayahs (Probationers).
- 1 Orderly.
- 1 Driver for Armstrong-Siddeley box body car on loan from Transport Department.

There has been no change in the working of the clinic during the year. One ayah who had become too old and blind to be able efficiently to carry out the duties required of her at the clinic, was transferred to the Infectious Diseases Hospital more in the capacity of chaperon and general help than as ayah; two new ayahs were taken on. These native women work very well on the whole. Both senior ayahs can be trusted to manage a normal labour without European supervision. They are not allowed to make vaginal examinations alone, and rely on abdominal palpation; either the Medical Officer or the Health Visitor can be summoned immediately, if required.

The building has been lime-washed and the floors re-cemented. The kitchen, which had become very dilapidated, was rebuilt.

The water is pumped from a well; this was re-covered and re-cemented during the year, as mosquitoes were found to be breeding in it. All water has to be pumped when required, the storage tank is apt to overflow through the ceiling of the out-patient dressing-room.

During the cool season electric light and power was supplied, this has greatly improved the conditions for night work.

Owing to the damage to the linen store by ants and rats a new zinc-lined cupboard was purchased.

The medical equipment has been considerably supplemented and the clinic has now a good stock of instruments.

During the first nine months of the year, much difficulty was experienced with the old Ford car, which was continually breaking down. A new 14-h.p. Armstrong-Siddeley car, with a box body suitable for carrying patients and stretcher cases has been supplied. Although the engine gave some trouble to begin with, this has been remedied and is proving very satisfactory. The car is now garaged at the European Hospital near to the Health Visitors' quarters and so is available at any time.

As concerns the in-patient work, there was one case of twins—normal labours, both vertex presentations—male and female infants.

One case of abortion at four months, triplets, premature labour due to hydramnios.

Premature labour was induced in one of the probationary ayahs for generally contracted pelvis; the child was born alive, but, unfortunately, collapsed and died 26 hours later. One of the post-natal cases admitted was a woman of the King's African Rifles who had been confined in the lines about six hours previously. She was found during a routine visit to the lines. Examination showed a complete rupture of the perineum—she was removed at once to the clinic and sutured under anæsthesia; the case of post-partum hæmorrhage was also a King's African Rifles woman admitted after her confinement in the lines. Douching and plugging resulted in the expulsion of a small portion of retained membranes.

The premature birth occurred in a woman with severe anæmia due to ankylostomiasis infection. The child was born normally and survived, the mother made a good recovery from her confinement and her general condition improved. The post-natal case of pneumonia was brought in from the native town and found to be too seriously ill for treatment at the clinic, so was transferred to the Sewa Hadji Hospital.

Of the ante-natal cases admitted, all three threatened abortions subsided under treatment ; three cases of malaria in pregnant women cleared up under treatment and the pregnancies continued. The women were admitted with a history of having aborted outside ; malaria parasites were found in their blood ; both made uneventful recoveries.

One woman who came from up-country was treated at the clinic prior to her transfer to the Sewa Hadji Hospital, where she was operated on by Dr. Connell for repair of perineum, following a six-months-old complete rupture causing fæcal incontinence. The operation was successful and a satisfactory sphincter and partial perineum were restored ; unfortunately, she insisted on returning to her home before she was properly healed.

Among the children admitted were 21 cases of chest trouble, chiefly broncho-pneumonia in infants. Three cases of marasmus (with one death) were treated ; and three nursing mothers in whom restoration of breast feeding was successfully established. The convalescent case was the child of an ayah transferred from the Sewa Hadji Hospital after operation for empyema.

The deaths were as follows :—

- (1) One case of marasmus aged 14 days : mother and twin had died on the shamba.
- (2) One case of broncho-pneumonia in an infant aged 10 months, admitted collapsed and almost dying—lived 12 hours only.
- (3) Twin children aged a few hours only. Mother was confined in railway quarters. Help was asked for six hours after the birth. The children were found uncovered and very cold, with the cords cut but not ligatured. Both succumbed to hæmorrhage and shock. The mother recovered.
- (4) A woman admitted moribund, uterus in a state of tonic contraction. History of having been in labour three days : only lived for half an hour after admission.

POLICE.

For the first two months of the year the lines were visited weekly by the Health Visitor ; in March, with the consent of the Commissioner of Police and Prisons, a weekly medical parade was instituted, at which the women and children are seen by the Medical Officer in charge of Maternity and Child Welfare. This parade is held in addition to the weekly house-to-house visit.

During the 10 months March to December, roughly half the female population attended each week, and they appear to appreciate the work done for them.

The health of the women and children is, on the whole, good ; owing to the number who showed symptoms of anæmia, in October 106 women were given carbon tetrachloride treatment, and clinically have improved since then.

The marked improvement in the general condition of the quarters and sanitary cleanliness of the barracks is the work of the officer in charge of the barracks and his staff, to whom great credit is due, and whom I would thank most heartily for their unfailing help and co-operation.

The parade, owing to lack of accommodation, has to be held in the Orderly Room ; this is not satisfactory as it is impossible to examine the women properly. It is hoped that provision will be made in the new barracks for a medical inspection room or dispensary, where the parades can be held and minor ailments treated.

It is endeavoured to get the women to come into the clinic for their confinements, but many go out to their shambas.

The chief conditions treated at the inspections are coughs and mild chest troubles, "homa," indigestion, conjunctivitis, general debility and anæmia, sores, and minor injuries.

KING'S AFRICAN RIFLES.

The health of the women and children of the 6th Battalion of the King's African Rifles stationed in Dar-es-Salaam is, on the whole, good.

Maternity and child welfare at the camp has its own special difficulties, due in part to the distance of the clinic from the lines, and in part to the fact that the women are to some extent under military discipline and living within a military cantonment. Many unattended births still occur in the lines, with resultant risks to mother and child: the reason for this is that notice of onset of labour is given so late that there is insufficient time to get the parturient woman to the clinic.

A weekly parade of the women in the lines is held, and a certain amount of advice and treatment is given which, from force of present circumstances, is more or less perfunctory. However, the parade undoubtedly aids in gaining the confidence of the women, and thus preparing the ground for future work. By the request of the officer commanding, the weekly house-to-house visit has been discontinued.

There is still no building especially set aside for maternity work, but when the new King's African Rifles dispensary is erected it will be available for this work when not required by the male personnel. This is not a very satisfactory arrangement, but the best that can be achieved pending the construction of a special building.

In December, 145 women were given carbon tetrachloride treatment for hook worm. The chief conditions seen and treated at the inspections are minor injuries, mild chest troubles, "homa," headaches, simple skin troubles, indigestion, and ante-natal examinations.

SUMMARY OF WORK DONE, 1926-1928.

					1926.	1927.	1928.
<i>Out-patients—</i>							
New Cases—							
Mothers	..	..	..	..	913	1,831	2,939
Children	..	..	..	..	1,827	4,082	3,419
Total	..	..	..	..	2,740	5,913	6,359
Attendances—Mothers					2,069	7,876	9,423
Ante-natal examinations					—	134	271
<i>Admissions to Clinic—</i>							
Women	..	..	..	..	36	68	70
Children	..	..	..	..	—	32	58
Total	..	..	..	..	36	100	128
Confinements	..	..	..	..	24	27	23
Post-natal state	..	..	..	..	—	10	19
Ante-natal state	..	..	..	..	—	9	7
Abortions and miscarriages	..	..	..	..	—	3	3
Other conditions	..	..	..	..	12	19	18
<i>Home Visiting in the Native Town, etc.—</i>							
Visits to King's African Rifles lines	..	..	..	..	197	—	{ 94
„ Police lines	..	..	..	..	—	—	{ 99
„ Railway lines	..	..	..	..	—	—	22
„ Government school	..	..	..	..	—	—	282
„ Confinements in own homes	..	..	..	..	—	4	3
„ Premature births in own homes	..	..	..	..	—	2	2
„ Still-births in own homes	..	..	..	..	—	1	1
„ New births in own homes	..	..	..	..	—	29	30
„ Other conditions	..	..	..	..	—	2,485	2,157
Total Visits	..	..	..	..	1,680	2,718	2,690
<i>Deaths—</i>							
Maternal	..	..	..	..	—	1	1
Children	..	..	..	..	—	—	4

SUMMARY OF CASES ADMITTED TO CLINIC.

Women—

For parturition	23
Normal labours	18
Induced premature labour	1
Ruptured perineum	2
Still-birth	1
Retained placenta	1
In post-natal state	19
Normal labour	11
Retained placenta	3
Ruptured perineum	2
Post-partum hæmorrhage	1
Premature birth and ankylostomiasis	1
Pneumonia	1
In ante-natal state	7
Pregnancy and malaria	3
Threatened abortion	3
Tonic contraction of uterus	1
Abortions	3
Abortion (outside)	2
Abortion (triple pregnancy and hydramnios)	1
Other conditions	16
Mastitis	2
Mastitis following abortion on shamba	1
Ruptured perineum (for operation)	1
Yaws ulcer	2
Tonsillitis	1
Ankylostomiasis	2
Malaria	3
Influenza	2
Salpingitis	1
Beri-beri	1
Total admissions	68

Children—

Pneumonia	21
Fever	8
Restoration of breast feeding	3
Insect sting	1
Convalescent	1
Fracture (internal malleolus)	1
Ankylostomiasis	6
Marasmus	3
Bilharzia	1
Yaws ulcers	1
„ rash	1
Septic feet	2
Indigestion	1
Pemphigus	2
Scabies and impetigo	2
Conjunctivitis	4
Total admissions	58

Of these cases, 18 were infants, in most cases accompanied by their mothers.

GOVERNMENT CENTRAL SCHOOL.

The health of the scholars is on the whole good. The improvement in the general condition and cleanliness of those who have been in the school for some months is marked, in comparison with new arrivals.

An attempt has been made to examine, medically, every entrant within his first term. No applicant has so far been refused admission on medical grounds.

The impossibility of testing the vision of entrants with any degree of success has led to this being discontinued—Snellens' types were tried, and also plain black lines, but

owing to the complete lack of response from the examinees, the results were useless. Most of the children refused to answer at all; a few repeated whatever word was last spoken to them. One teacher and one boy were supplied with spectacles during the year. Owing to the difficulty and cost of providing them, they are recommended only in exceptional cases. It is endeavoured to apprentice the boys to the work most suitable for them, so that they shall incur no undue strain which might, when half way through their apprenticeships, necessitate the change from one trade to another.

Many of the new children were found to be suffering from scabies; these soon cleared up with treatment. The apparent increase in the number of scabies, impetigo and septic rash cases is, in my opinion, due to the increased supervision which it has been possible to carry out, and the frequent unexpected visits of inspection made to the classes while at work, thus catching many who would not otherwise have attended the dispensary.

The incidence of malaria is higher than last year, probably owing to the same reason. Owing to the large number of Anopheline breeding places in the vicinity of the school, since July, all the boarders receive every evening a prophylactic dose of 5 grains of quinine.

The large number of children who presented symptoms of anæmia, more or less severe, led to the administration of carbon tetrachloride to all those present on a certain date in November: 330 boys and all native teachers were treated. The carbon tetrachloride was given in varying doses, according to age. From 3 minims to 40 minims in from $\frac{1}{2}$ -ounce to 1 ounce of magnesium sulphate (gr. x ad 1 ounce).

One case of chicken-pox was seen. The patient and his brother were admitted to the Infectious Diseases Hospital, and no further cases occurred.

Conjunctivitis and ulceration of the cornea are frequent. These cases are usually sent to the Maternity and Child Welfare Clinic for treatment, in an endeavour to stop their spread.

During June, an outbreak of sore mouths developed among the boarders—out of 53 boys, 23 showed symptoms of more or less severe glossitis. Sores at the angles of mouth, in some cases a definite tonsillitis developed. Bacteriological examination of scrapings, etc., showed no fungus nor bacteria other than a secondary staphylococcal infection. A trace of albumen was present in all cases showing severe glossitis. Blood was absent from urine—investigation of the diet showed that there was some deficiency in animal protein; increased rations of meat and fish, with additional fresh fruit and vegetables, led to an improvement, and although the cases continued until the end of the term, none has been seen since.

Injuries mostly of a minor character, chiefly cuts and bruises, provide a large number of the cases treated.

Among the unclassified cases are those of venereal disease, congenital heart disease, contractures and deformities, often due to old burns, injuries, and probably anterior poliomyelitis.

Although there was a fairly severe outbreak of pneumonia in the native town during the latter part of the year, the number of cases at the school was fewer than last year: this may be accounted for by the early and repeated examinations of the chests of all children with coughs, and their admission to hospital as soon as symptoms of bronchitis or pneumonia developed.

In May, all the scholars were examined by the Government dentist, and those requiring treatment were dealt with during June and July.

The kitchen is not satisfactory, and it is recommended that a new one should be built. The lack of adequate water supply necessitating its storage in the kitchen in buckets, etc., is not satisfactory, nor does it provide an example of hygiene measures such as is so desirable to keep before the oncoming generation of Africans.

The latrine accommodation, as was pointed out by the Medical Officer of Health in his Report for 1924, and each succeeding year, is entirely inadequate and unsatisfactory. The scheme for new latrines, which was being prepared, has not materialised—this is of urgent importance, and should be delayed no longer.

Two of the three existing dormitories are in urgent need of repair ; also the beds.

The lighting of the junior class rooms, native-made makuti huts, is barely sufficient, and more window space is advised.

The general sanitary arrangements are poor, and it is recommended that, in addition to new latrines and kitchens, an adequate incinerator should be installed.

An improvement has been effected in the dispensary by the removal of one of the partitions ; there are now one large room and one small examination room with a bed in it.

A list of chief conditions treated is appended.

	1927.	1928.
Average number of scholars on roll	428	400
„ daily attendance	392	364
„ number of boarders on roll	32	48
„ „ „ resident	29	44
New cases	3,110	3,297
Total attendances	27,458	12,067
Cases referred to Native Hospital	99	68
„ sent to Infectious Diseases Hospital	—	2
Cases treated—		
Pneumonia and bronchitis	165	28
Pulmonary tuberculosis	1	1
Mild chest conditions	458	344
Influenza	119	—
Measles	10	—
Chicken-pox	—	1
Tick fever	1	1
P.U.O. “ Homa ”	427	348
Malaria	42	74
Yaws	42	31
Scabies	193	221
Jiggers, impetigo, boils, ulcers, septic, sores..		
and other skin conditions	583	347
Tinea and “ Mba ”	140	112
Ankylostomiasis	107	113
Bilharzia	19	4
Indigestion, etc.	307	229
Disease of eye	121	185
„ ear, nose and throat	82	116
Headache, toothache	69	32
Vaccinations	—	155
Injuries	342	474
Unclassified.. .. .	127	489

EXTRACT OF A REPORT ON THE PUBLIC HEALTH OF TANGA FOR THE YEAR 1928.

BY DR. R. NIXON, M.B., CH.B., D.T.M., D.P.H. (Liv.), SENIOR HEALTH OFFICER,
TANGA.

PUBLIC HEALTH.

The general health of the local population during the year has been satisfactory.

There has been no serious epidemic disease with the exception of a few cases of anthrax in the Moa district and four sporadic cases of enteric in the town.

VITAL STATISTICS.

European.—Three European deaths occurred in the town. Two were imported cases who died from chronic pulmonary tuberculosis and the third a case of fractured skull incurred in a motor accident.

Three European deaths were also recorded in the sub-districts, one at Ngomeni (Blackwater fever), one at Moa (Blackwater fever) and one at Amboni (Carcinoma).

Accepting the imported cases into the Tanga records, the following are the comparative figures in the last three years :—

	1926.	1927.	1928.
Population	320	374	466
Births	9	16	17
Birth rate	28.1	42.8	36.5
Deaths	6	3	6
Death rate	18.7	8.0	12.8

European Morbidity.—165 Europeans received treatment at Tanga Hospital as compared with 110 last year, but the average sick time fell from 2.37 to 2.15 days and the percentage of sick to average residents fell from 0.65 to 0.58.

Three Europeans were invalided, being cases of carcinoma, epilepsy and metrorrhagia.

It will be seen from the average duration of sickness that the large majority of European cases were suffering from minor lesions. In addition to the cases already referred to as deaths or invalidings the most important European cases were 78 malaria, one enteric and one tuberculosis.

Asiatic.—The morbidity figures of the general Asiatic population cannot be obtained with any accuracy and the births and deaths recorded (19 and 8 respectively) are understatements as a result of failures of notification.

The following are comparable figures of Asiatic officials over the last three years :—

	1926.	1927.	1928.
Population	100	96	110
Deaths	—	1	2
Invalidings	1	2	1
Cases of sickness	195	225	153
Average duration (days)	6.2	4.8	9.52

The two deaths were due to Blackwater fever.

African.—The African births and deaths notified by jumbes for town and district are 599 and 753 as compared with 509 and 460 last year. No reliance whatever can be placed on any of these figures as the returns omit large and varying quantities of both births and deaths. I believe both birth rate and death rate to be considerably in excess of those given by the above figures and have found no corroborative evidence to suggest that the death rate is above the birth rate.

The following are comparable accurate figures for cases under treatment in Tanga Hospital.

	1926.	1927.	1928.
Out-patients	11,354	14,626	10,269
In-patients	1,723	1,958	2,049
Total	13,077	16,584	12,318
Deaths	67	149	129

Almost all these cases are males, but some evidence of female African morbidity may be obtained from the appended report on maternity and child welfare.

The majority of African sickness treated in hospital has been due to minor injuries and disturbances of the alimentary and respiratory systems.

The most important infections are ankylostomiasis, malaria and tuberculosis. The following are the numbers of these cases treated in Tanga Hospital.

	1927.	1928.
Ankylostomiasis	1,121 (45 deaths)	1,086 (19 deaths)
Malaria	1,200 (1 death)	1,225 (no deaths)
Tuberculosis	80 (19 deaths)	143 (39 deaths)

Ankylostomiasis and tuberculosis are frequently concurrent, which accounts in part for the rise in the death column of one disease with an approximately similar fall in the other.

Other African infections treated in Tanga Hospital show the following comparative figures :—

	1927.	1928.
Yaws	1,642	1,232
Schistosomiasis	174	147
Filariasis	82	73
Meningitis	4	2
Syphilis	398	310
Gonorrhœa	186	111

INFECTIOUS DISEASES HOSPITAL.

As no smallpox or other serious infection occurred during the year it was possible to admit all the advanced cases of pulmonary tuberculosis from Tanga Hospital and so obviate the risk of infection of other cases in hospital. As most of these were suffering from serious and rapidly progressive lesions the death rate is necessarily very high.

The figures for 1928 are :—

Remained	1
Admitted	85
Total	86

These consisted of the following :—

Pulmonary tuberculosis	64
Chickenpox	16
Measles	3
Leprosy	2
Syphilis	1

The results were as follows :—

Died (all from tuberculosis)	39
Cured and discharged	17
Relieved and discharged	10
Absconded	12
Transferred	2
Remaining	6

MATERNITY AND CHILD WELFARE.

The clinics for this work are at Ngamiani Centre, at the police lines and at the Government school.

In addition to daily visits to these three places, the Health Visitor has attended some cases in their homes. During 1928 minor structural alterations have been made at the Ngamiani Centre and some new equipment has been added. Full details of the cases attended at the various clinics are given in the appended reports on maternity and child welfare and on the health of Tanga school children.

The following are the numbers of cases seen during the last two years :—

	1927.	1928.
New cases seen by Health Visitor (excluding school)—		
Women	1,526	1,629
Children	1,709	1,512
Cases attending Ngamiani Clinic—		
Women	1,340	1,392
Children	992	1,300
Cases at Police Clinic—		
Women	149	165
Children	139	182
Cases at Tanga School	1,329	1,669

MOSQUITOES AND ANTI-MOSQUITO WORK.

The rainfall of the year, although less than that of 1927, was well above the average of the preceding years. There were two periods of heavy rain, March to June and the whole of November. Both, but particularly the former, were accompanied and followed by the

usual increase in house-infesting mosquitoes. The mosquito figures of the whole year approximate very closely to those of 1927. The period July to October showed the lowest mosquito index yet recorded in Tanga. The general position is that the enormous decrease in mosquito incidence as compared with the years 1919-1924 has been maintained, but there are still two or three months each year when there is a definite mosquito nuisance.

The following table gives the rainfall and the larval collections month by month :—

—				Culex.	Stegomyia.	Anopheles.	Others.	Total.	Rain.
									Inches.
January	..	..	..	140	102	16	1	259	1·06
February	..	..	..	122	72	9	—	203	1·27
March	..	..	..	138	79	7	—	224	3·67
April	..	..	..	134	211	5	4	354	6·77
May	..	..	..	242	253	19	2	516	16·12
June	..	..	..	269	208	42	6	525	5·86
July	..	..	..	186	86	20	8	300	0·20
August	..	..	..	147	103	15	8	273	2·60
September	..	..	..	135	114	6	6	261	1·95
October	..	..	..	100	88	5	4	197	0·79
November	..	..	..	152	158	5	6	321	14·35
December	..	..	..	211	217	41	10	479	1·77
TOTAL..	..	..	..	1,976	1,691	190	55	3,912	55·69

				Per cent.	
Culex	50·5
Stegomyia	43·2
Anopheles	4·8
Others	1·5

I have used an arbitrary mosquito index composed of larval collections per 100 inspections of premises. This index shows the following figures for the last few years :—

				Per cent.	
1923	5·9
1924	5·6
1925	3·0
1926	3·7
1927	2·7
1928	2·4

I have found that in Tanga, using the present system and staff, this index bears roughly the following interpretation in terms of house infestation and nuisance, *i.e.*, when the index is over three mosquitoes in most houses are a genuine nuisance, but when it is below two the number of mosquitoes in most houses is almost negligible. Accepting this, some idea of the improvement in Tanga mosquito conditions can be deduced from the fact that the index exceeded eight during the four worst months of both 1923 and 1924, while it has never been above four during any month of 1927 or 1928.

The index month by month during 1928 is as follows :—

				Index.	Rainfall.
					Inches.
January	..	..	..	2·5	1·06
February	..	..	..	1·9	1·27
March	..	..	..	1·7	3·67
April	..	..	..	3·1	6·77
May	..	..	..	3·9	16·12
June	..	..	..	3·6	5·86
July	..	..	..	1·9	0·20
August	..	..	..	1·9	2·60
September	..	..	..	1·8	1·95
October	..	..	..	1·5	0·79
November	..	..	..	2·8	14·35
December	..	..	..	3·3	1·77

It may be remembered that the notorious press contribution dogmatising on the increase of mosquitoes in Tanga was written after a short visit in May when the monthly rainfall was the highest recorded for six years.

The following is an analysis of the mosquito breeding places of the year :—

—	Culex.	Stegomyia.	Anopheles.	Others.	Total.
Tanks, barrels, etc.	541	783	5	20	1,349
Pots, jars, etc.	106	302	5	4	417
Wells and waterholes	302	92	32	6	432
Pits	243	29	4	9	285
Pools	324	78	127	9	538
Drains	331	124	14	5	474
Tins	99	189	2	1	291
Other casual water	29	95	1	1	126
TOTAL	1,976	1,691	190	55	3,912

In household receptacles	1,766, <i>i.e.</i> , 45·1 per cent.
In casual water	1,429, <i>i.e.</i> , 36·5 „
In wells and waterholes	432, <i>i.e.</i> , 11·1 „
In pits	285, <i>i.e.</i> , 7·3 „

Collections in household receptacles are generally small, while those in pits or in certain collections of casual water are relatively enormous. A defective pit may produce many thousand mosquitoes before the source of the nuisance is located and in Tanga defective pits are many. The house-infesting mosquito of Tanga is *Culex fatigans*, a lover of dirty water for breeding purposes. Underground dirty water in defective pits and drains is probably the source of the bulk of local mosquitoes.

The rise in Anopheline collections is disquieting, but less important than it appears ; 190 collections of larvæ were found, as compared with 102 last year, but almost all were on the outskirts of the town, particularly in the Kisosora area, and it is rare to find an Anopheline mosquito in any of the European houses, while it is difficult to trace any primary infection with malaria in the European area. Although many *Stegomyia* collections of larvæ were found it is very rarely that the adult is found in the houses. *Culex fatigans* comprises 99 per cent. of the house-infesting mosquitoes of Tanga.

ROUTINE ANTI-MOSQUITO MEASURES.

Inspections—

	1926.	1927.	1928.
Premises	107,521	143,963	166,831
Drains	23,164	16,044	15,479
Pits	177,165	120,056	135,448
Wells	16,935	20,805	18,243
Tanks, barrels, jars, etc.	234,091	317,598	347,796

Grass cutting and drain cleaning—

	1927.	1928.
Grass cutting (square yards)	850,000	920,000
Drain cleaning (linear feet)	343,000	469,000

MALARIA.

The Anophelines of Tanga are few and largely confined to the fringes of the native town. Primary infection of Europeans within the township is very rare, and the malaria figures given below consist, to a large extent, of cases infected up-country or recurrent attacks of old infections. The histories of all the European cases and some of the non-European have been traced. Of the primary infections, with two exceptions only (Asiatic children), all had spent one or more evenings outside the township at the initial stage of the incubation period.

Tanga Hospital returns show :—

							European cases.	Non-European cases.
1926	..	..	..	..	..	..	40	1,622
1927	..	..	..	..	..	..	55	1,369
1928	..	..	..	..	..	..	78	1,394

In his annual report on these cases, the Senior Medical Officer writes : “ I think that, with three exceptions, all the confirmed cases of malaria that came under notice were contracted elsewhere than in Tanga.”

Of 61 cases confirmed microscopically, 47 were of the sub-tertian and 14 of the benign tertian variety.

There were no deaths from malaria.

The school clinic records 81 attacks as compared with 110 last year and the welfare clinics 80 as compared with 129.

BLACKWATER FEVER.

Four cases, one European and three Asiatics, were treated in Tanga Hospital. Two of the Asiatic cases died. Two European cases were treated in remote parts of the district and in both cases the attack ended fatally.

FILARIASIS.

Seventy-three cases came under observation as compared with 43 last year ; 16 were cured by operation.

As all these cases were suffering from chronic lesions, there was no possibility of tracing the place of infection.

DENGUE.

Dengue has not been observed in text-book form, but four cases of fever with a dengoid rash came under observation.

SMALLPOX.

For the second year in succession a clean bill is returned for smallpox for town and district and two cases only have occurred during the last five years. This is eminently satisfactory, having regard to the past record of the district and its regular communication with infected areas ; 9,414 vaccinations of travellers were performed at the Health Office. As the cases were not seen again, we have no record of the proportion of successes ; 140 school-boys were vaccinated—of whom 41 reacted, a satisfactory proportion in view of the fact that the majority were revaccinations.

ANTHRAX.

Twenty-two cases of anthrax, with 8 deaths, occurred in the Moa Sub-district in October. The deaths were due to septicæmia, following malignant pustule, and all ended within 48 hours of the first lesion. The epidemic ran a very short and limited course, veterinary quarantine was imposed, and no spread has been reported.

TUBERCULOSIS.

It is certain that tuberculosis is a serious and common disease in the district, and the evidence available suggests that it is on the increase.

The Tanga Hospital records are as follows :—

				Cases.	Deaths.
1926	..	..	..	47	34
1927	..	..	..	80 (+1 European)	18
1928	..	..	..	143 (+3 Europeans)	39 (+2 Europeans)

The two European cases of 1928 were not local infection, but imported cases who entered the district in a very advanced stage of the disease.

There are real difficulties in attempting to assess the progress of tuberculosis in the district. The native authorities who submit the death returns of the villages have for

years regularly ascribed some 25 per cent. of their deaths to "safura," a term which means to them nothing more than a chronic wasting and debilitating disease. It has been the custom at this office to place the "safura" cases into the ankylostomiasis group, as this disease was known to be very prevalent. It is obvious that such deaths as have occurred from tuberculosis or any other chronic disease, have been included in the ankylostomiasis table. Many times the diseases are concomitant. A chronic ankylostomiasis case is most suitable material for a superimposed tubercular infection. Even in hospitals, when deaths occur in patients suffering from both conditions, it is merely diagnosis idiosyncrasy that decided to which group, tubercle or hookworm, the death shall be ascribed. In 1927, Tanga Hospital records 45 deaths from ankylostomiasis and 19 from tuberculosis, and in 1928, 19 from ankylostomiasis and 39 from tuberculosis. The Senior Medical Officer agrees that this does not mean a big fall in ankylostomiasis and a big rise in tuberculosis, but that the majority of these cases were suffering from both diseases. As all the cases diagnosed tuberculosis in 1928 were confirmed microscopically from the sputum or by post-mortem appearances one is forced to the conclusion that we have under-estimated the prevalence and importance of tuberculosis in the past and have probably over-estimated ankylostomiasis as a cause of death. Of the 143 Native tuberculosis cases diagnosed at Tanga Hospital in 1928 the majority showed a severe type of infection and the prognosis was bad, as can be gathered from the fact that 39 of them have already died in the Infectious Diseases Hospital. If 100 severe infections have applied for treatment at Tanga Hospital, it is obvious that there must be in the district many more milder cases who have not yet sought treatment.

Of 3,144 cases seen at the various welfare clinics in the town during 1928, only 4 were diagnosed tuberculosis, which suggests that the disease is probably less prevalent in the town than in the sub-districts.

ANKYLOSTOMIASIS.

I have already referred to the difficulties in assessing the prevalence and importance of this disease.

The following are comparative figures from the available records:—

	1926.	1927.	1928.
Total cases, Tanga Hospital	1,284	1,121	1,086
In-patients, Tanga Hospital	133	129	75
Deaths, Tanga Hospital	51	43	19
Cases at Welfare Clinics	—	137	90
Deaths reported by Jumbes	176	119	91

It will be seen that all sources of information indicate a steady decrease in cases and deaths. Missionary opinion in the district and native local opinion confirm the decrease. I have already pointed out, however, reasons for caution in comparing the recorded figures.

SCHISTOSOMIASIS.

One hundred and forty-seven cases were treated, as compared with 174 in 1927. The majority of cases were under 20 years of age and were cured or improved by treatment. We have not yet been able to find any known larval host of the schistosome in the town.

YAWS.

Tanga Hospital figures indicate a decrease in the prevalence of yaws; 1,232 cases were treated, as compared with 1,642 in 1927 and 1,561 in 1926. The acute cases of 1928 were treated in hospital, but the majority attended weekly as out-patients for intramuscular injections.

PLAGUE AND RATS.

No plague occurred during the year.

The following rats were destroyed:—

R. rattus rattus, 1,450; *R. rattus alexandrinus*, 546. Total, 1,996.

VENEREAL DISEASES.

	1926.	1927.	1928.
Syphilis (cases)	346	398	310
Gonorrhœa (cases)	236	186	111

LEPROSY.

A special report on leprosy and anti-leprotic measures of 1928 is appended.

PORT HEALTH WORK.

The shipping entering the port continues to show an annual increase. The following are the vessels cleared during the last three years :—

	1926.	1927.	1928.
Steamers	243	283	357
Dhows	797	864	674

No case of infectious disease entered the town during the year.

SLAUGHTERHOUSE RETURN.

In the absence of veterinary staff at Tanga, the supervision of the slaughterhouse, the inspection of animals before slaughter and of all meat before exposal for sale, continues to be carried out by the staff of the Health Department.

The following are the 1928 figures :—

Animals slaughtered—			
Bullocks			2,319
Sheep and goats			3,138
Pigs			31
Carcases condemned and destroyed			16
Portions of carcases condemned and destroyed			1,716

THE GENERAL SANITATION OF TANGA.

Funds for a pipe-borne water supply became available in 1928 and further sums for buildings, roads and other purposes are to be expended in 1929.

The progress of the town during 1928 has been more real than apparent. While there is little obvious surface change, the first steps have been taken for the provision of a pure-water supply, for the development of the Ras Kazone area and for the addition of new offices and houses in the town. Changes actually effected during the year include the removal of the obsolete and unsightly trolley line running through the main streets of the town, some road improvements, the most important of which are the reconstruction of the first part of the Mombasa road and the tarred surface of King Street, the erection of a new Tanga Club, the demolition of the dilapidated bandstand in Selous Square. It is in the works initiated in 1928 rather than those completed that one bases hopes of the real and immediate progress of Tanga.

Water Supply.—Water has been found in boreholes near the railway shops which is of excellent quality and probably available in sufficient quantity to form the basis of a pipe-borne supply to the town. The material for tower and pipes by which the town will be fed has not yet arrived, but it is hoped that the work will be completed during 1929.

When an increased supply of water is brought into any town, provision should be made to remove the extra water from the town after use. The present drains of Tanga will need considerable alteration.

HOUSING AND TOWN PLANNING.

The Ras Kazone area is the most suitable area in the township for residential purposes and has been reserved accordingly.

The area between the hospital and the railway bridge which is privately owned has been surveyed and is being developed. The Tanga Club building and four houses of

European type have been practically completed during 1928 and further development is anticipated.

No building has yet been commenced on the Government area of Ras Kazone, but the Township Authority have recommended that the six new bungalows authorised for the coming year should be built here. If, as is anticipated, a few of the Government plots are sold to the public, there will probably be houses built by non-officials on these sites at an early date.

Town planning in Ngamiani is stationary. The scheme put forward in 1924 for the construction of a new market on the west side of Pangani Road and the development of a trading area here fell through from lack of the necessary funds. The Native area still has its commercial area straggling from the Native market in Swahili Street at one end of the town along Fundi Street and Akida Street and even further from the market. Town planning in Ngamiani is unsatisfactory, while it is impossible to define a trading area.

European building has not been extensive during 1928. Work is in hand on two churches, two cinemas, three clubs (European, Goan and Indian) and a few houses and offices, the most important of which are those on Ras Kazone already mentioned. Additional housing is being provided for officials by the erection of two new bungalows and by the unfortunate expedient of subdividing existing houses.

The following permits were issued by the Township Authority during 1928 :—

To erect houses	..	..	..	..	..	..	..	23
To erect huts ..	..	..	..	..	..	..	..	140
To repair houses	..	..	..	..	..	..	..	92
To repair huts	..	..	..	..	..	..	..	961

Conservancy.—19,832 cartloads of refuse were collected and burnt during the year.

Storm-water Drainage.—The storm-water drainage system is inefficient and in the Native town requires almost complete reconstruction. Regularly certain areas of the town are converted into swamp land or ponds after heavy rain, with resulting injury to property and health. Some of these ponds persist for weeks. The most important crossing in the Native town (Akida Street–Ngamiani Road) is impassable after heavy rain, being flooded to a depth of 3 or 4 feet.

Until the Ngamiani drainage is remodelled, periodical flooding is certain, and any attempts at road making rendered abortive.

FOOD IN RELATION TO HEALTH.

Generally, the crops of 1928 have been good, and there has been no scarcity of food. At the time of writing there is a threat of locust invasion from the north. It is most profoundly to be hoped that this does not materialise. The health and financial damage which would follow cannot be estimated.

The following foodstuffs have been condemned and destroyed by the Health Department during the year :—

Tinned milk	..	..	..	..	..	30 cases and 1,890 tins.
Potatoes ..	..	..	..	..	..	160 kilo.
Maize ..	..	..	..	..	..	100 kilo.
Millet ..	..	..	..	..	..	61 kilo.
Vermicelli	..	..	..	..	..	144 packets.
Sardines ..	..	..	..	..	..	45 tins.
Cheese ..	..	..	..	..	..	52 tins.
Cider ..	..	..	..	..	..	3 cases.
Macaroni ..	..	..	..	..	..	2 cases.
Other provisions	..	..	..	..	..	34 tins.

EDUCATIONAL.

Propaganda on health and preventive medicine has been carried out in the district by African District Sanitary Inspectors stationed in the large villages and visiting the smaller ones. The more important facts and figures supplied by them have already been embodied in earlier sections of this report.

SUMMARY OF METEOROLOGICAL OBSERVATIONS.—TANGA, 1928.

Month.	Number of days rainfall.	Total monthly rainfall. mm.	Average daily rainfall. mm.	Average maximum temp. ° Cent.	Average minimum temp. ° Cent.	Average mean temp. ° Cent.	Average dry bulb, 9 a.m. ° Cent.	Average dry bulb, 2 p.m. ° Cent.	Average wet bulb, 9 a.m. ° Cent.	Average wet bulb, 2 p.m. ° Cent.
January	6	26.8	0.86	32.22	24.60	28.41	28.49	31.20	25.05	26.10
February	7	32.1	1.10	32.85	25.13	28.99	29.21	31.84	24.87	25.91
March	15	92.5	2.98	32.85	24.65	28.75	28.66	31.63	25.74	25.90
April	22	170.7	5.69	30.64	23.60	27.12	27.49	28.94	24.52	24.71
May	20	406.3	13.10	29.12	22.35	25.735	25.60	27.96	22.82	23.24
June	17	148.6	4.95	28.43	21.38	24.905	24.64	27.46	22.63	22.99
July	8	5.0	0.16	28.00	19.93	23.965	24.01	27.12	20.70	21.38
August	18	65.8	2.12	27.94	20.13	24.035	24.17	26.50	21.37	21.56
September	18	49.2	1.64	28.83	20.81	24.82	25.18	27.71	22.26	22.44
October	12	20.0	0.64	30.37	21.25	25.81	26.61	29.36	22.74	23.30
November	24	361.7	12.05	30.04	26.25	28.145	26.24	28.94	23.70	23.87
December	19	44.6	1.40	31.07	23.95	27.51	27.58	29.97	24.25	24.81
TOTAL	186	1,423.3	46.69	362.36	274.03	318.195	317.88	348.63	280.65	286.21
MEAN	15.5	118.608	3.89	30.196	22.837	26.516	26.49	29.052	23.387	23.85

The Health Visitor pays regular visits to the native town and immediate villages to instruct the women in the elements of maternal and child welfare.

A course of lectures has been given at the Health Office in elementary tropical hygiene. Three candidates for positions as District Inspectors and three school-boys attended the course and four of the six passed the examination in December.

METEOROLOGY.

The monthly rainfall in inches compared with the average of the preceding six years is as follows :—

	Average (1921-27).	1928.	Increase or decrease.
January	3	1	— 2
February	2	1	— 1
March	5	4	— 1
April	10	7	— 3
May	9	16	+ 7
June	3	6	+ 3
July	2	0	— 2
August	3	3	+ 0
September	3	2	— 1
October	4	1	— 3
November.. .. .	3	14	+ 11
December	3	2	— 1
TOTAL	50	57	+ 7

The total rainfall was 7 inches above the average and 7 inches below that of last year.

Temperature.—Detailed temperature figures are given on page 72.

HEALTH OF CHILDREN ATTENDING TANGA CENTRAL FOR THE YEAR 1928.

There has been no serious disease in the school during the year and the boys are generally healthy and active.

The school dispensary has been attended daily by the Health Visitor, and doubtful cases have been referred to this office for diagnosis and treatment. The cases of yaws and schistosomiasis have received treatment at Tanga Native Hospital.

The cases attending the school dispensary during 1928 number 1,669, as compared with 1,329 last year. The bulk of them are trivial cases, consisting of superficial injuries and minor diseases of the skin, respiratory and digestive systems. The following are comparable figures :—

	1927.	1928.
Sores, bruises, cuts, etc.	594	511
Minor respiratory lesions	145	229
Minor skin infections	255	411
Minor intestinal disturbances	49	55

The following are the comparative figures of the more important infections :—

	1927.	1928.
Malaria	110	81
Ankylostomiasis	3	30
Schistosomiasis	5	8
Yaws	20	17
Scabies	57	41
Influenza	60	—
Conjunctivitis	49	67

There has been no venereal disease recorded in the school during the year.

The rise in the ankylostomiasis cases is noteworthy.

None of the cases were heavily infected, and all improved on treatment, but it is curious to find a rise in the school coinciding with a fall in the local hospitals and dispensaries. If there is any significance in this small rise it must lie in the unsatisfactory latrine system in use. This, however, is in process of reconstruction at the time of writing.

One hundred and forty vaccinations were performed during the year, and 437 boys received elementary instruction on quinine prophylaxis from the Health Visitor.

Three school-boys attended a course of instruction in elementary hygiene given at the Health Office for African District Sanitary Inspectors, and one of them did extremely well in the examination.

EXTRACT OF A REPORT ON THE PUBLIC HEALTH OF TABORA FOR THE YEAR 1928.

BY DR. R. MACKAY, M.B., CH.B. (Aberd.), HEALTH OFFICER, TABORA.

II.—PUBLIC HEALTH.

(a) GENERAL REMARKS.

During the year under review there were no serious outbreaks of epidemic diseases, and the general health of the community was well maintained; sporadic cases of diseases such as whooping-cough, measles, chicken-pox and influenza were, however, reported.

The standard of sanitation maintained in the district and province of Tabora is good, and this is in a large measure due to the united efforts of District Sanitary Inspectors and chiefs in educating the population as to hygienic conditions of living, the elimination of factors which are conducive to ill-health and kindred matters affecting the health of the community.

(b) VITAL STATISTICS.

Population.—The following figures* show the estimated population for the years 1926, 1927, 1928 for the sub-districts of Tabora province:—

Year.	Europeans.	Africans.	East Indians.	Chinese and Malay.	Mixed.
TABORA DISTRICT—					
1926.. .. .	230	178,800	1,275	—	10
1927.. .. .	250	184,000	1,500	—	100
1928.. .. .	254	179,000	2,360	—	—
NZEGA DISTRICT—					
1926.. .. .	6	153,500	80	—	50
1927.. .. .	17	153,500	150	—	300
1928.. .. .	20	121,685	510	—	—
KAHAMA DISTRICT—					
1926.. .. .	19	76,000	34	—	32
1927.. .. .	22	75,868	18	—	15
1928.. .. .	29	80,034	112	—	—
SHINYANGA DISTRICT—					
1926.. .. .	81	150,550	Not stated	—	223
1927.. .. .	35	144,450	90	—	130
1928.. .. .	65	149,109	239	—	—

* The figures were obtained from the Administrative Department.

Tabora Township: Estimated Population, 1928.

		Europeans.	Asiatics.	Africans.	Total.
Male ..	..	110	1,200	3,000	4,310
Female..	..	60	500	6,000	6,560
Total ..	..	170	1,700	9,000	10,870

General European Population: Population, 170, Tabora Township.

					1926.	1927.	1928.
Births—							
Male .. ..	..	..	..	..	6	4	4
Female .. ..	..	..	..	..	6	3	4
Total .. ..	..	..	..	..	12	7	8
Deaths under 1 year—							
Male .. ..	..	..	..	..	—	—	—
Female .. ..	..	..	..	..	1	—	—
Total .. ..	..	..	..	..	1	—	—
Deaths, all ages—							
Male .. ..	..	..	..	..	—	2	3
Female .. ..	..	..	..	..	2	2	—
Total .. ..	..	..	..	..	2	4	3

N.B.—No infantile mortality figure is given as there were no infant deaths (European) during 1928.

The three European deaths in 1928 were due to:—

Pneumonia	1
Injuries (Buffalo)	1
Acute delirium	1

Annual death rate—

1926	8·6 per 1,000.
1927	16·0 „
1928	11·8 „

The foregoing data refer to Tabora sub-districts and do not include figures for Shinyanga, Kahama or Nzega.

Asiatics: (Statistics, Population, 1,700, refer to Tabora Township only).

					1926.	1927.	1928.
Births—							
Male .. ..	..	..	..	..	22	14	12
Female .. ..	..	..	..	..	15	10	4
Total .. ..	..	..	..	..	37	24	16
Deaths under 1 year—							
Male .. ..	..	..	..	..	3	7	6
Female .. ..	..	..	..	..	9	1	4
Total .. ..	..	..	..	..	12	8	10

Still-births notified and not included above, 4.

					1926.	1927.	1928.
Deaths, all ages—							
Male	13	20	10
Female	12	7	8
Total	25	27	18

Annual death rate:—

1928	10·5 per 1,000.
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Infantile mortality rate:—

1928	625 per 1,000 births.
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General Native Population, Township: Population, 9,000.

Births—							1926.	1927.	1928.
Male	..	..	..	..	..	..	93	61	35
Female	..	..	..	..	..	..	121	65	54
Total	..	..	..	..	..	..	214	126	89
Deaths under 1 year—									
Male	..	..	..	..	..	..	18	24	21
Female	..	..	..	..	..	..	21	23	17
Total	..	..	..	..	..	..	39	47	38
Infantile mortality rate:—									
1926	..	..	..	..	..	..	182	per 1,000 births.	
1927	..	..	..	..	..	..	373	,,	
1928	..	..	..	..	..	..	426	,,	
Deaths, all ages—							1926.	1927.	1928.
Male	..	..	..	..	..	..	153	133	133
Female	..	..	..	..	..	..	124	131	133
Total	..	..	..	..	..	..	277	264	266
Annual death rate:—									
1928	..	..	..	..	..	..	..	29·5 per 1,000.	

Total African Native deaths notified:—

Male	..	..	..	..	..	..	133
Female	..	..	..	..	..	..	133
							266

The death rates given above are based on the 1928 figures of population—Tabora Township, which is stated to be 9,000. (Figures were obtained from the Provincial Commissioner.)

*General Native Population: Tabora Province.**Tabora Sub-district.*

Population (1928) 179,000.									
Sex.							Births.	Deaths under 1 year.*	
Male	..	..	..	..	..	..	385	41
Female	..	..	..	..	..	..	376	51
Total	..	..	..	..	..	..	761	92

* Infantile mortality rate—120 per 1,000 births.

The infantile mortality rate for the last three years is given as follows:—

1926	..	..	..	..	..	..	167	per 1,000 births.	
1927	..	..	..	..	..	..	174	,,	
1928	..	..	..	..	..	..	120	,,	
Deaths, all ages—							1926.	1927.	1928.
Male	..	..	..	..	..	..	476	801	422
Female	..	..	..	..	..	..	532	419	383
Total	..	..	..	..	..	..	1,008	1,220	805

The following data of births, deaths under one year and infantile mortality rates refer to the King's African Rifles :—

Births—						1926.	1927.	1928.
Male	..	..	..	..	..	21	31	36
Female	..	..	..	..	..	40	24	28
Total	..	..	..	..	..	61	55	64
Deaths under 1 year—								
Male	..	..	..	..	..	10	5	11
Female	..	..	..	..	..	7	9	4
Total	..	..	..	..	..	17	14	15
Infantile mortality rates per 1,000 births						279	254	234

It would appear that the welfare work undertaken at Tabora has contributed towards the reduction in the infant mortality rates during the last two years.

III.—HYGIENE AND SANITATION.

(a) GENERAL REVIEW OF WORK DONE AND PROGRESS MADE.

Satisfactory progress has been maintained throughout the year along lines previously established, particularly with regard to Maternity and Child Welfare work and the organization of the African District Sanitary Inspector personnel.

The Native has begun to realise the importance of the work carried out by the welfare clinic in dealing with conditions peculiar to pregnant and parturient women and ailing infants, if the readiness with which women and children are brought to the clinic for advice is any indication to guide one, the results obtained are gratifying, although much remains to be done in this connection.

With regard to the organization of African District Sanitary Inspectors, each sub-district of Tabora Province is now provided with its full establishment. Twenty-six inspectors were trained at Tabora during the year, eighteen of which became available for posting within the province. The work carried out by African Sanitary Inspectors is undoubtedly of value, particularly where it has been possible to arrange for periodical supervision by a European. A European Sanitary Superintendent was engaged on this particular work during the year, and the results in more accurate reports and efficiency generally have been satisfactory.

(1) *Preventive Measures.*

Mosquito and Insect-borne Diseases, Anti-mosquito Measures—Tabora Township :—

Number of inspections of premises	..	..	..	..	25,272
Number of collections of mosquito larvæ found	..	..	..	..	1,222
Percentages of houses breeding mosquitoes	..	..	..	..	16.3
Number of notices served for mosquito nuisances	..	..	..	..	362
„ drains inspected	..	..	..	..	2,159
„ pools inspected	..	..	..	..	571
„ wells inspected	..	..	..	..	1,847
„ areas inspected	..	..	..	..	1,085
„ tanks and barrels inspected	..	..	..	..	55,967
„ yards of drain cleared	..	..	..	..	13,890
„ yards of drain dug	..	..	..	..	300
„ holes filled in	..	..	..	..	9
„ gallons of kerosene used	..	..	..	..	80
„ cess and soakage pits inspected	..	..	..	..	24,419
Mosquito-larvæ : incidence—					
Number of collections of mosquito larvæ found	..	..	..	..	1,222
„ inspections of premises	..	..	..	..	25,272
Index $\frac{\text{collections} \times 100}{\text{inspections}}$	..	..	..	..	4.7
Anopheles	..	..	32.3	per cent.	1.5 (Index)
Culex	..	..	48.8	„	2.3 „
Stegomyia	..	..	18.9	„	0.9 „

Drains, pools and swamps are responsible for the somewhat heavy anopheline breeding in Tabora Township. The months of April and May show an exceptionally high curve for anopheles (*vide* chart) and this is probably due to the inadequate drainage available and to the non-porous nature of the subsoil. It is therefore preferable to have a complete masonry drainage system to cope with the heavy collections of water in the Chem-chem and Kitete areas in the rainy season. It has been found that the mosquito-incidence curve can be kept fairly low by routine oiling, drain clearing and other anti-mosquito measures, during the greater part of the year.

With regard to anti-mosquito work in the out-districts, progress has been made, inasmuch as a certain number of the native population have been taught through the medium of African District Sanitary Inspectors, the danger attendant on having mosquito-breeding foci on their premises and the simple methods which they may put into practice in helping to prevent malaria.

The Senior Medical Officer, Tabora, states that 1,115 cases of malaria were treated at the hospital during the year. Of that total 56 were Europeans. There was only one death in an Asiatic female, who succumbed to cerebral malaria.

The figures for the last three years total cases are given as under :—

Cases	1926.	1927.	1928.
.. .. .	1,513	778	1,115

The figures for 1926 are higher than those of the two years following, and this is probably due to the exceptionally high rainfall of 1925–26. The figures for 1927 and 1928 correspond to the respective rainfall curves for these two years. The total cases and amount of rainfall for the period under review are represented as follows :—

	Total cases.	Rainfall in inches. (Average).
1926	1,513	43·7
1927	778	34·5
1928	1,115	35·5

Blackwater Fever.—Three cases of blackwater fever (non-European), as compared with 11 in 1927, were reported during the year. There were no deaths.

Relapsing Fever.—Thirty-eight cases of relapsing fever occurred during 1928; two of these were Europeans. There were no deaths.

Filariasis.—No cases of filariasis were reported during the year.

Epidemic Diseases.

Influenza.—An epidemic of influenza was experienced during the year among the prisoners of Tabora gaol. There were 90 cases, with no deaths; the figure for 1927 was 4.

Chickenpox.—There was a total of 62 cases of chickenpox in 1928, mostly from the Government School and K.A.R. "lines." These occurred in the earlier part of the year. The usual methods of isolation and quarantine sufficed to quell the outbreak. There were no deaths. There were 31 cases in 1927.

Whooping-cough.—There were 14 cases of whooping-cough reported during the year. These cases were sporadic, with no deaths.

Measles.—Only one case of measles was met with in 1928, as compared with 14 cases in 1927.

Mumps.—Three cases of mumps occurred during the year; there were 21 cases in 1927.

There were no cases of plague, smallpox or cerebro-spinal fever reported during the year.

A synopsis of total vaccinations performed during the year is appended.

Enteric Fever.—Four cases of typhoid fever were treated at the hospital during the year, two of which were Europeans ; there was one death (Native).

Dysentery (Amæbic and Bacillary).—Twenty-three cases of dysentery were reported during the year, one of which was a European ; there were two deaths (Native).

Helminthic Diseases.

Ankylostomiasis.—Although more cases of ankylostomiasis are reported as having occurred in Tabora Township during 1928, there were fewer deaths from this disease than in the preceding two years. Both these facts tend to point to earlier recognition of the disease, *i.e.*, the patient reporting in the early stages—and therefore to more prompt treatment. The following data are given for purposes of comparison :—

<i>Ankylostomiasis—Tabora Township.</i>	1926.	1927.	1928.
Number of cases	21	29	56
Number of deaths	10	13	8
Percentage of total deaths	3·6	4·9	3·0

The majority of cases, however, are reported from the out-districts by African District Sanitary Inspectors. The seriousness of ankylostomiasis, with regard to the important rôle it can play in undermining the efficiency of a person as a useful member of the community, and its still more serious effects on the health of the individual—when unrecognised and untreated, is being continually impressed on African District Inspectors, and it may be stated this measure has resulted in a certain amount of success, particularly with regard to mass treatment by carbon tetrachloride and oil of chenopodium.

The following figures refer to deaths attributed to ankylostomiasis in the out-districts for the last three years :—

	Tabora District.	Shinyanga District.	Kahama District.	Nzega District.
1926	137	41	Nil	11
1927	126	Nil	13	31
1928	123	14	37	93

Schistosomiasis.—199 cases of schistosomiasis were reported as having occurred in Tabora Hospital during the year. There were no deaths. The number reported in 1927 was 39.

There are several pools in the Chem-chem and Rufita areas of Tabora Township from which *Bullinus* or allied species have been recovered. Several attempts were made by crushing the snail and mounting preparations under the microscope to find bifurcated-tailed cercariæ, but nothing beyond what were taken to be fresh-water protozoal parasites was discovered.

Taeniasis.—45 cases of taeniasis were reported during the year. Three of these were Europeans. The number reported during 1927 is 19 ; there were no deaths.

Deficiency Diseases.—There were no cases of beri-beri or rickets within the last two years.

Two cases of scurvy sent in from the gaol at Shinyanga were treated in the hospital in 1928 ; there were no deaths.

Infectious Diseases.

Tuberculosis.—There were 18 cases of tuberculosis (pulmonary) during the year, with 10 deaths. The figure for 1927 was 7.

Syphilis.—The total number of cases of syphilis reported during the year is 1,181, with one death. This figure is considerably increased as compared with 1927 with 976 cases.

Yaws.—The number of yaws treated in the hospital during the year was 1,136, with one death. This is somewhat lower than the total for 1927, which was 1,320 cases.

Leprosy.—One case of leprosy is reported as having occurred during 1928 and one during 1927.

With regard to preventive measures malaria and ankylostomiasis were in the main the diseases concentrated upon. Apart from the routine anti-mosquito work of drain-clearing, grass cutting, oiling, organization of mosquito-catchers, routine inspection of all mosquito breeding places was made, and the danger of all potential breeding foci was eliminated by having broken septic and soakage-pits repaired, uncovered water tanks rendered mosquito proof where possible, and the aid of occupiers of houses and premises solicited with a view to removal of such breeding places as pots, jars and other utensils.

Certain recommendations were made with a view to the improvement of drainage in the township, and it is understood that certain of these are to be carried into effect in the near future. (The drain leading from the railway hotel, which breeds anopheline mosquitoes during the major part of the year, is here referred to.) The Railway Department have constructed a complete water-carriage system for the disposal of excreta in the residential area near the railway station; this in itself is an anti-malarial measure inasmuch as mosquito-breeding individual units of dilapidated cesspits and drains for other effluents are no longer necessary.

In the matter of ankylostomiasis, much has been done in the township in the way of improving pit-latrines in private dwellings and abolishing them entirely in institutions, like the gaol, the hospital, the schools, etc. In the latter part of the year mass treatment of ankylostomiasis by capsules of carbon tetrachloride and oil of chenopodium was introduced. This work was carried out by the various African Sanitary Inspectors in their respective districts through the medium of the chief of the particular area. In Shinyanga, Kahama and Nzega the District Officers have undertaken to carry out similar work. This measure is considered to be popular with the general Native population in Tabora district, and should go far towards curtailing the incidence of the disease.

Diseases like influenza, measles, chickenpox and others occurring in epidemics have been dealt with as the occasion arose by isolation, quarantine and other measures indicated in the particular disease.

METEOROLOGICAL REPORT.—TABORA TOWNSHIP.

Shade Temperatures.										Rainfall Amount in inches.
Month	Highest maximum Fahr.	Lowest maximum Fahr.	Range.	Mean.	Mean dry bulb.		Mean wet bulb.			
					9 a.m.	2 p.m.	9 a.m.	2 p.m.		
January ..	92.3	64.4	27.9	77.0	70.8	84.2	66.7	71.6	5.33	
February ..	91.2	65.3	25.9	76.25	70.5	81.8	67.4	73.4	4.7	
March ..	89.3	64.2	25.1	76.2	71.2	82.5	67.8	73.5	9.2	
April ..	89.6	65.3	24.3	74.9	69.4	79.5	66.5	71.6	8.03	
May ..	86.0	62.3	23.7	74.6	69.4	81.1	65.3	70.7	1.4	
June ..	86.9	62.6	24.3	74.7	68.9	83.6	64.2	70.1	Nil	
July ..	89.6	58.1	31.5	73.91	65.3	81.5	59.1	67.1	Nil	
August ..	89.3	} minimum thermometer out of order.	}	}	67.8	83.4	61.7	70.7	Nil	
September ..	97.0				72.1	86.7	65.3	71.7	0.1	
October ..	96.8				71.5	86.0	62.2	64.4	0.5	
November ..	95.0				74.8	87.6	65.8	67.1	0.8	
December ..	93.1				70.7	79.8	65.5	68.1	7.99	

Total rainfall for the year, 38.05 inches; number of days on which rain fell, 119 days; highest rainfall on any one day, 2.6 inches; mean maximum shade temperature for the year, 91.3.

ANNUAL VACCINATION REPORT.—TABORA PROVINCE.

Month.	Primary Vaccination.				Re-vaccination.			
	Total number vaccinated.	Total number re-inspected.	Successful.	Un-successful.	Total.	Number re-inspected.	Successful.	Un-successful.
January ..	4,637	3,151	1,793	1,358	174	90	30	60
February ..	3,386	2,111	1,273	838	—	—	—	—
March ..	4,009	2,514	1,749	765	—	—	—	—
April ..	1,141	605	397	208	—	—	—	—
May ..	4,370	2,474	1,363	1,111	—	—	—	—
June ..	3,311	1,656	995	661	392	342	226	116
July ..	2,165	1,199	812	387	148	60	26	34
August ..	4,598	3,597	2,370	1,227	—	—	—	—
September ..	3,022	2,745	1,726	1,019	—	—	—	—
October ..	4,145	2,775	2,052	723	174	86	34	52
November ..	2,406	1,384	941	443	102	72	42	30
December ..	4,187	3,013	2,174	839	334	327	185	142
TOTAL ..	41,377	27,224	17,645	9,579	1,324	977	543	434

(2) General Measures of Sanitation.

Conservancy.—Removal of the excreta in the Native area is carried out by means of the pan system, the ultimate disposal being by incineration and trenching. There are seven public latrines which accommodate the more congested areas in the township. No nuisance whatsoever has followed on trenching in spite of the non-porous nature of the subsoil. Pit latrines are, of course, used in the majority of cases in dwellings, and the greater bulk of excreta is disposed of in this manner.

Two new public latrines of a permanent type, it is understood, are to be built before the close of the financial year; the site was demarcated during the year. The pan system is in use at the schools, the gaol, police lines and King's African Rifles lines in the township.

The water-carriage system is in use in practically all Government houses, each house having its complete system of septic tank, soakage pit, etc.

The following is a summary of conservancy work done in the township during the year :—

Number of inspections of premises	25,272
„ latrines ordered to be dug	835
„ collections of fly-maggots found	591
„ cart-loads of refuse removed	4,347
„ rats caught	160
„ burial permits issued	310
„ collections of spirillum ticks found	43
„ gallons of disinfectant used	56

Conservancy Work in Sub-districts :—

Summary.	Tabora.	Shinyanga.	Kahama.	Nzega.
Collections of fly-maggots ..	2,241	301	130	2,343
Latrines ordered to be dug ..	6,557	1,995	1,735	3,896
Dumps of refuse removed ..	15,079	1,746	407	2,936
Rats caught	610	147	443	1,090
Burial permits issued ..	805	63	178	525

Refuse Disposal.—Refuse is collected by ox-drawn carts and conveyed to the various incinerators in the township for destruction. This method of disposal is satisfactory, but a good deal of trouble has been experienced owing to the cart-axles and hubs breaking. This is being remedied by having the cast-iron hubs replaced by hubs made from “shop-brass.” The disposal of refuse at the K.A.R. and police lines, the school and the gaol is carried out by the Department concerned; an incinerator is available in each case.

Drainage.—The need for masonry drains in the Chemchem and Kitete areas of the township is pressing. These two areas with their bad earth-drains and swamps produce anopheline mosquitoes for the major part of the year. A great deal of time and labour is spent on keeping these areas moderately free from mosquitoes; the construction of a masonry drain leading from the K.A.R. lines through Kitete (along the course of the existing earth-drain) into Chemchem would obviate this and render these areas mosquito free. This work, however, would be costly, as subsoil drainage would be necessary in dealing with the Chemchem area.

There are good masonry drains running parallel to the main roads in the township and near the Native market.

The drainage area of the township administered by the railways is good, masonry drains being in use.

Temporary earth-drains are cut by the Health Department from time to time in an endeavour to drain pools, etc., in the rainy season. There is no subsoil drainage system in use in the township.

Water Supplies.—Tabora relies for its water supply on three main wells in the catchment area at Kitete. The water is pumped into storage tanks placed at a point sufficiently high to supply the highest point in the township by gravity. The main supply is laid directly into pipes which are led into most Government houses and to stand-pipes. There is no filtration system available. Water is available for sale to the general public at the market and elsewhere. The supply is good and appears to be ample for the requirements of the township except, perhaps, in the very dry months when a certain amount of economy has to be practised. There are five iron tanks used for storage with a total capacity of approximately 24,000 gallons. The amount pumped into the tanks daily is roughly 20,000 gallons; 1,500 gallons per hour are available. The supply is somewhat milky in appearance on account of the high proportion of silicates it contains.

The results of an analysis made during the year are given below. The analysis was made in an endeavour to check the nature of the water used by the soda-water manufacturers, who often tend to use water from questionable sources in preference to buying it from the main supply. The figures are not given as being strictly accurate, but they convey a general impression of the nature of the water supply of the township. The results of the analysis are as follows :—

Sample of Water from Kitete Main Supply : Wells.

Source of supply	..	..	..	..	..	..	..	Shallow wells.
Possibility of contamination	..	..	..	..	..	..	..	Remote.
Results of Chemical and Physical examination—								
1. Colour	..	..	..	..	..	..	..	Milk opalescence.
2. Odour	..	..	..	..	..	..	..	Nil.
3. Turbidity	..	..	..	..	..	..	..	Definite opacity.
4. Reaction	..	..	..	..	..	..	..	Neutral.
5. Residue on evaporation	..	..	..	..	..	..	..	Trace; no charring.
6. Free Ammonia	..	..	..	..	..	..	..	Nil. (This test showed a flocculent precipitate probably due to an excess of Magnesium Salts.)
7. { Chlorine	..	..	..	..	..	..	..	Six parts per 100,000.
{ Sodium Chloride	..	..	..	..	..	..	..	Nine and a half parts.
8. Nitrites	..	..	..	..	..	..	..	Nil. (Not revealed by test.)
9. Nitrates	..	..	..	..	..	..	..	Nil. (Not revealed by test.)
10. Hardness	..	..	..	..	..	..	..	Under 4 degrees (very soft).
11. Lead, Zinc, Copper and Iron	..	..	..	..	..	..	..	Nil.
12. Oxygen absorbed in 15 minutes at 100 deg. C.	..	..	..	..	..	..	..	Less than 0·10 parts per 100,000.

Remarks.—This sample is one from a good well and is suitable for domestic purposes. There is a somewhat high absorption of oxygen, pointing to the presence of organic matter of a vegetable or animal nature. A bacteriological examination would be necessary before giving a more definite report.

Cemeteries.—There are 10 cemeteries in the township as follows :—

European	..	..	..	..	1
Indian	..	..	..	..	2
Hindu	..	..	..	..	2
Native and Arab	..	..	..	..	3
Mission	..	..	..	..	2

Other Measures of Sanitation.—With regard to other measures of general sanitation such as clearing bush and undergrowth, grass cutting, drain clearing, etc., all these are attended to as occasion demands. Details of this work have already been given above. A commencement was made during the year to clear the bush between the boma and the railway station crossing the Kilimatinde road. As tsetse fly is present only seven miles from this particular spot it is conceivable that the heavy undergrowth referred to might well become infested through the medium of vehicles entering the township from that direction.

King's African Rifles Cantonment: Sanitation.—The sanitary condition of the King's African Rifles cantonment is very satisfactory.

The water supply consists of a large tank connected with the cantonment to which water is led from the main supply.

The collection and disposal of excreta is carried out by the pan-incinerator system, which gives every satisfaction.

Refuse is collected daily and disposed of by incineration.

There is a detachment of sanitary "askari" available to supervise the sanitation of the cantonment.

Weekly visits of inspection are carried out by the Sanitation Officer or members of the Health Office staff.

(3) *School Hygiene.*

The general health of the pupils attending the Government School during the year has been satisfactory. The following figures refer to the biannual medical inspection carried out at the Government School, Tabora :—

Defects and Diseases found :—

Head—		Abdominal—	
Impetigo	2	Umbilical hernia	4
Eyes—		Rt. Inguinal hernia	1
Blindness	1	Inguinal glands	4
Strabismus	1	Enlarged spleen	24
Trachoma	1	Other conditions—	
Conjunctivitis	1	Gonorrhœa	1
Corneal opacity	1	Syphilis	1
„ ulcer	1	Phimosis	1
Mouth and Throat—		Anæmia	5
Caries of teeth	3	Deformed toes	2
Tonsillitis	35	Ulcers	1
Cardiac—			
V.D.H.	3		

Routine examination of urine and fæces were carried out ; the results were as follows :—

Schistosomiasis	5
Ankylostomiasis	6
Tæniasis	4

These were the total positive specimens out of 158 examined.

Diseases treated at School Dispensary :—

Diseases of the external ear	1	Tapeworm	4
Conjunctivitis	11	Hookworm*	142
Impetigo	143	Malaria	21
Scabies	16	P.U.O.	7
Boils and septic sores	27	Diarrhœa	7
Wounds and bruises	58	Constipation	5
Dental cases	31	Schistosomiasis	86
Mild bronchial conditions	45	Tonsillitis	24
Bronchitis-	24	Other conditions	113
Pneumonia	1		

* The majority of cases of ankylostomiasis and schistosomiasis were met with in Kisigo School, the above total being a return of diseases occurring in both schools during the year.

The School Dispensary is under the charge of a tribal dresser, who sees and treats simple cases daily. Both Kisigo and the main Tabora School are visited thrice weekly by a member of the Health staff. The water supply of both schools is good. The conservancy system in use is the pan-incinerator one.

There are eight private schools in the township. These are visited by the health visitor frequently, and cases are treated at the clinic.

The diet is satisfactory in the schools under the administration of the Government. Premises in all cases are satisfactory.

(4) *Labour Conditions.*

Labourers engaged on public work within the township work under favourable conditions with regard to medical treatment, hours of labour, etc.

With regard to labourers living in camps in the district, as at the Shinyanga mines, the conditions appear to be favourable, the diet being good and the accommodation satisfactory.

There were no cases of deficiency diseases amongst labourers during the year.

Labour recruitment is carried out in Tabora township; all recruits are medically examined at the hospital

(5) *Housing and Town Planning.*

Township Authority : Summary.

Number of meetings held during the year	..	..	..	..	9
„ permits issued for sale of food, etc.	..	..	..	..	504
„ plans approved in respect of buildings of European standards of sanitation	..	..	..	..	5
„ permits issued <i>re</i> improvements and reconstruction	..	..	..	..	32
„ permits to repair buildings issued	..	..	..	..	26
„ permits to build native huts issued	..	..	..	..	66
„ permits to repair Asiatic and Native houses	..	..	..	..	580
„ permits to dig pit-latrines issued	..	..	..	..	484
„ permits to erect native kitchens	..	..	..	..	134
„ orders to demolish Native huts issued	..	..	..	..	20

Considerable improvement has been effected in premises used for the sale and storage of foodstuffs, hides and other merchandise within the township. An inspection of all such premises was carried out prior to issuing permits, and improvements calculated to minimize the rat population of such places and improve the sanitary conditions generally, were effected.

The building of Native huts cannot take place until the site has been approved by the Health Officer and Staff Surveyor.

The building of two new Native latrines of a permanent type was approved during the year.

With regard to the improvements in drainage within the township, the railways installed a complete water-carriage system dealing with the residential area near the station. The Authority caused an inspection to be made of the drainage system of the hotel at Tabora. This was found to be defective and approval was given by Government to have a new drainage system installed at an estimated cost of 4,000/-; the work is being proceeded with.

(6) *Food in Relation to Health and Disease.*

Inspection of all foodstuffs exposed for sale has been carried out periodically during the year. Foodstuffs found or suspected to be unfit for human use have been dealt with under Section 29, Township Rules, 1923.

Milk.—The conditions under which milk is sold in the township are unsatisfactory. The suppliers (principally “Watusi”) have rigorously resisted all attempts at putting

the sale of milk on a more satisfactory sanitary basis. Immediately any such measures are attempted the supply automatically stops. A recommendation is made to get over this difficulty, namely, to get the European contractor (food) to buy all the milk required each day, to have collections individually tested for water dilution, etc., and thus to render the supply somewhat more satisfactory.

Meat.—All meat for the requirements of the township is slaughtered at the abattoir under the supervision of the stock inspector, who releases only healthy carcasses.

The conditions at the market are not so satisfactory, however, inasmuch as the meat-cages are in a dilapidated condition. The defect was brought to the notice of the Public Works Department locally in the middle of the year.

Cleanliness is fairly well maintained, although there is not a sufficient head of water to utilize a hose. The markets are sprayed with a weak solution of disinfectant weekly.

(b) MEASURES TAKEN TO SPREAD THE KNOWLEDGE OF HYGIENE AND SANITATION.

Apart from the training of African sanitary inspectors, a certain amount of hygiene and sanitation was taught to the pupils of the Government School locally at the instigation of the Superintendent of Education in charge. Weekly lectures were given in Kiswahili, such matters as personal hygiene, housing, diseases and their ætiology, preventive measures and some elementary physiology being mainly dealt with. Infant feeding and child welfare were briefly referred to also.

At the request of the Medical Officer, Tabora, lectures on hygiene and sanitation were given twice weekly to tribal dispensers undergoing training.

There was no opportunity in the latter part of the year to give lectures on elementary hygiene to the general population. Such lectures were given, however, in the districts by Native sanitary inspectors, but particularly with regard to ankylostomiasis and mass treatment.

(c) TRAINING OF SANITARY PERSONNEL.

A class of 26 probationary district sanitary inspectors was trained at the Health Office during the latter part of the year. The training was mainly practical. The pupils were taught the methods of inspecting premises for insanitary conditions, the correct form of compiling reports, the methods of dealing with collections of water, rubbish, etc.; in the prevention of diseases.

Theoretically a certain amount of hygiene was taught, the main diseases of the tropics were dealt with briefly, as well as their method of spread and prevention.

Housing, water supplies and conservancy and their bearing on the spread of disease and health were also gone into.

Infant feeding, the method of performing vaccinations, etc., completed the syllabus.

(d) RECOMMENDATIONS FOR FUTURE WORK.

Under this heading one may again enumerate the proposals already set forth elsewhere, viz. :—

- (1) The construction of masonry drains to deal with the Chemchem and Kitete areas.
- (2) The establishment of a proper basis which will enable the public to obtain milk with the element of danger reduced as far as this is possible.
- (3) The clearing of dense bush skirting the township on the north-east side, this being a potential haven for tsetse fly.
- (4) This recommendation, not hitherto referred to in this report, is deemed to be an important one, namely, that the present Welfare Centre building be enlarged. This is an urgent necessity in view of the increasing popularity of the very necessary work of maternity and child welfare.

- (5) Finally, it is recommended that all reports by African District Sanitary Inspectors be carefully checked by the District Officer or Sub-Assistant Surgeon concerned, and all erroneous and contradictory statements eliminated, and thus have recourse to more reliable data than are at present available.

V.—MATERNITY AND CHILD WELFARE.

It may be stated that progress is being steadily made in this direction. The work being done at the clinic is increasing in popularity with the population.

VI.—HOSPITALS, DISPENSARIES, ETC.

The only building to be considered under this heading in this report is the Maternity and Child Welfare Clinic building. It is of stone and lime with a corrugated iron roof. It is provided with six windows with mosquito gauze and shutters. There are four rooms as follows :—

Labour room (two beds).
Lying-in room (two beds).
Out-patients' room.
Office and dispensary.

The water supply comprises two tanks each of 150 gallons capacity, of which one is of concrete and was built by the Health Office during the latter part of the year. The water is conveyed to the clinic by the Public Works Department daily. Two out-houses, a kitchen and bathroom respectively are attached.

EXTRACT OF A REPORT ON THE PUBLIC HEALTH, MWANZA, FOR THE YEAR 1928.

BY DR. D. E. WILSON, M.B., CH.B., HEALTH OFFICER, MWANZA.

Frequent changes were unavoidably made in the office of Sanitation Officer during the year 1928. From the beginning of the year up to 6th February, 1928, Dr. H. V. R. Mostert was Sanitation Officer. On Dr. Mostert's resigning from the service Dr. W. J. Aitken was posted from Tabora. Dr. Aitken proceeded on home leave on 27th August, 1928.

Dr. D. E. Wilson was then appointed Sanitation Officer, Mwanza, this being a first appointment.

Mr. W. M. Mackay was Sanitary Superintendent for the year.

A new appointment was made in the appointing of Miss E. Ashberry to be a Health Visitor. This appointment dated as from 1st November, 1928.

H. L. Victor was appointed as Asiatic Clerk as from 29th September, 1928. This was a new appointment and made on the condition that his services be equally distributed between the hospital and the Health Office.

Of the 18 District Native Sanitary Inspectors in the Mwanza Province, one, Joseph Manzagata, was allowed to leave the service on the grounds of his being urgently required by his father (the Mtemi of Uluma District). It was, unfortunately, found necessary to discharge two inspectors during the year, one, Juma bin Zaidi, for refusing to obey instructions, and Mwigonje bin Kapama, on the grounds of his not likely to become an efficient inspector. There are at the moment 15 District Native Sanitary Inspectors in the Mwanza Province.

In addition two inspectors were trained towards the end of the year at Tabora, and have already been posted to the Musoma District.

RETURN OF STATISTICS OF POPULATION FOR THE YEAR 1928.—MWANZA PROVINCE.

—	Europeans.	Indians and Goans.	Africans and Arabs.	Chinese and Malays.	Mixed and Coloured.
Number of inhabitants, 1927 ..	320	2,600	890,000	—	—
„ births, 1928 ..	—	5	—	—	—
„ deaths, 1928 ..	1	39	1,266	—	—
Emigrants, 1928		No records kept.			
Immigrants, 1928	33	137	2	—	—
Number of inhabitants, 1928 ..	—	—	798,641	—	—
Increase or decrease		Slight decrease to be noted.			

PUBLIC HEALTH.—MWANZA DISTRICT, INCLUDING UZINZA AND KWIMBA.

A.—Communicable Diseases.

(1) *Insect-borne Diseases.*

Malaria.—This disease is very common all round the lake, due to the swampy areas along the lake shore, which form ideal breeding areas for the anopheline mosquito.

The prevailing type of parasite is the *plasmodium falciparum*.

Blackwater fever does not appear to be very prevalent in Mwanza.

Elephantiasis.—Elephantiasis of the scrotum, leg and vulva is very common all over the district, and this is not to be wondered at considering the large number of culex mosquitoes in the district. The breeding of these mosquitoes is very difficult to control, as they breed in pools in the rocks which are scattered all over the district.

Dengue Fever.—I have seen two cases of this disease in Europeans.

(3) *Relapsing Fever.*

According to reports received by me from the Senior Medical Officer, relapsing fever is common all over the district.

B.—Infectious and Epidemic Diseases.

Plague.—This disease is endemic at Musoma, and during the past year there have been several small outbreaks. The first outbreak appears to have been in February, when two cases occurred with two deaths. A second outbreak was reported in July, when 24 deaths were reported. After this outbreak was reported the Senior Medical Officer, Mwanza, sent across to Musoma anti-plague vaccine. Most of these cases occurred in the out-district of Musoma. Of the 24 seven were reported to be in the town. Inoculation took place on a large scale, 2,000 doses of vaccine were despatched from Dar-es-Salaam to Musoma via Mwanza. Also one rat-catcher with traps was sent from Dar-es-Salaam to Musoma. On the 8th August a further outbreak was reported with one case and one death. Since then no further cases have been reported. On the 15th September I received information that two dead rats infected with *B. pestis* were found in the bilges of the S.S. "Clement Hill."

Whenever there were cases of plague reported at Musoma the port was put in quarantine and the lake steamers did not call. All steamers arriving in Mwanza were thoroughly examined for any sign of illness.

All dhows were kept outside the port and thoroughly inspected; the crew being stripped and examined and the names of the crew taken, and they were instructed to report at the Health Office daily for 10 days. Fortunately no cases of plague occurred amongst the crews.

No cases of plague occurred in Mwanza township during the year.

For rat extermination in Mwanza township *see* General Measures of Sanitation, page 93.

Smallpox.—During the year no acute cases of smallpox occurred in the district, although there were one or two scares.

On the 5th October, 1928, a prisoner was brought to the Health Office with a rash which proved to be chicken-pox. The prisoner came from Uzinza. A district Native Sanitary Inspector was sent out to Uzinza with 500 doses of lymph and smallpox cards. He did 254 vaccinations and returned reporting that smallpox was not present, and that he had seen no people with rashes. All the prisoners were vaccinated as a precautionary measure against smallpox.

Cerebro-spinal Fever.—There were no cases reported in the Mwanza district.

Chicken-pox.—There was quite an extensive outbreak of chicken-pox among the prisoners in Mwanza gaol.

Anthrax.—Early in the year an extensive outbreak of anthrax in cattle occurred in Ukerewe. This was dealt with by the Veterinary Officer, Mwanza. According to reports quite a number of Natives died there of what is presumed to be anthrax. I should imagine that most of these deaths were due to intestinal anthrax caused by eating infected meat and not to malignant pustule or pneumonic anthrax. About the end of November a letter was received from one of our District Native Inspectors that 60 cattle had died of "plague" at Ukerewe, and there had been seven sudden deaths in the community. I reported the matter to the Veterinary Department. I can only presume that these seven deaths were due to anthrax.

The Enteric Group.—No cases of enteric fever were reported from the district.

Leprosy.—I have seen very few cases of leprosy in Mwanza or district. One of my health boys had leprosy, and at present he is attending the hospital for treatment. There is no leper settlement near Mwanza.

Tetanus.—I have heard of no cases in the district or town.

Mycosis.—I have seen two cases of what appeared to be madura foot in the township. Ringworm of the body, groin and axilla is very common.

Schistosomiasis.—This disease is very common all round the lake, both *Schistosoma Hæmatobium* and *Mansoni* being found. Quite a number of school children at Mwanza Central School are infected. Those infected come in for treatment at the hospital.

ANTI-MOSQUITO WORK CARRIED OUT IN MWANZA TOWNSHIP DURING THE YEAR 1928.

Six mosquito-finders are employed on anti-mosquito work. During the year 169 mosquito notices were sent out, and it was necessary in nine cases to prosecute.

Prophylactic quinine is issued in tabloid form when available to Government officials free of charge. Unfortunately it is not always available in tabloid form. Quinine is also issued free at the Mwanza Gymkhana Club. Most of the European houses are now provided with a mosquito proof verandah and bedroom; this all tends to lessen the incidence of malaria.

Plague.—There were no cases of plague in Mwanza township during the year.

Mwanza must be considered a potential plague centre, and it would be very easy for plague to spread due to the extreme congestion in the Indian bazaar.

Until we have proper godowns for storage we shall continue to have many rats. At present all storage is done on the verandahs of the shops; this attracts rats, and certainly

does not improve the appearance of the town. I have tried in several cases to get the occupiers of plots to remove the material stored on their verandahs. This measure has met with very little success, as they have no other place in which to store their goods.

We are now striving to get godowns built. A site has been selected, and it is proposed to erect about 30 godowns. The site selected is outside the township.

Ankylostomiasis.—This disease is fairly prevalent in Mwanza and district. It is, fortunately, easily cured now, and the Native understands this and comes for treatment as soon as he thinks he is infected. We intend to start a mass treatment from the health clinic.

HYGIENE AND SANITATION.

Anti-malarial Measures.—The work done during the year 1927, training of staff and locating breeding grounds, etc., considerably improved the situation during the year 1928. A consistent routine kept the curve lower than in the previous year.

Filling-in work was continued in the Kartusi area and at the lake shore to the west of the Mwanza Railway Station. The work commenced in 1927, was carried on in 1928, but there are certain swampy areas near the lake shore where filling in on a small scale cannot bring about any appreciable difference. To cope with this area an incinerator is now being built, and it is hoped that in time a considerable part of the swampy lake shore will be reclaimed and mosquito breeding partly prevented therein.

The Kartusi area has been considerably improved, due to the methods of dealing with the anopheline breeding ground.

Perhaps the most misleading factor in the contribution towards mosquito breeding is the "backwash" from the lake, which leaves pools along the foreshore which are added to from time to time as long as a west wind is blowing. It is not practicable to deal with these pools by filling, but every fifth day they are treated with oil from Kirumba to a point to the south of the mission shamba, a distance of some two miles.

The pools found in the Kartusi area are formed by spring water. The surrounding lands are privately owned, and in each case natives are allowed to live on the land in return for work. These natives cultivate the land and make drainage systems to carry the water from the natural springs to their shambas. All "matuta" and faulty drainage systems are, needless to say, the breeding-places of anopheline and culex mosquitoes. Several natives have assisted in levelling the beds and filling in the drains which they have made in their shambas.

Inspection of Premises.—66,122 premises were inspected during the year. The main factor aiding greatly mosquito breeding in the township was, as in previous years, the careless way in which the Indian community lives. Despite the fact that 90 per cent. of Indian compounds are provided with washing slabs and soakpits, the practice of washing on the back verandah or on a board placed in the back yard will have preference, with the result that even in the dry season pools of dirty water form in the yards and are added to daily.

All this adds to the difficulty of prevention of mosquito breeding, and it is extremely difficult to convince the general community of the absolute necessity for co-operation without the very undesirable recourse to Court proceedings.

Lack of store accommodation has prevented strict observance of existing regulations, and until sites are available this Department will be faced with a problem for which there is no practical solution.

The ex-station hands have proved of additional value in anti-mosquito work, cutting grass and keeping the lake shores as far as possible free from bush and papyrus. The river known as the Marenga stream, which originates in the Nyakate Hills and flows north-west through the township and thence to the lake, was cleaned twice during the year and parts of it cleared and cleaned from time to time as circumstances demanded.

During the dry season, however, this river is dry, although water may be found by digging to a depth of one foot or more. It was somewhat puzzling to account for adult

mosquitoes (in the dry season) in the area close to the river, and suspicion would not naturally be directed to a dry river bed. On inspection, however, it was discovered that water boys, too lazy to go to the lake for water, had dug a series of holes about a foot in depth, and in each hole anopheline and culex mosquitoes were found breeding. Notices were put up in Kiswahili at several points in the river, but were found torn down and mutilated the following morning. Several of the offenders were caught and proved to be water boys of Indians and a type of Native difficult to deal with. Local building contractors were also guilty of the offence, but in their case the sand was the attraction, and considerable quantities were removed *at night time*. It is very difficult to get a conviction in a case of this kind as the matter appears to be considered a trivial one. One of the most glaring of such cases failed, and although it was considered necessary to appeal it was not considered a good case to appeal on when referred to Dar-es-Salaam. The Indian community contributes an unnecessary quota towards the general insanitary conditions existing in the township, which lead to mosquito breeding. The following table will give some idea of the extent of relative contribution towards mosquito breeding in Mwanza during the year 1928.

TABLE SHOWING NUMBER OF COLLECTIONS OF MOSQUITOES FOUND AND PERCENTAGE OF CONTRIBUTIONS TOWARDS MOSQUITO BREEDING IN COMPOUNDS OF EUROPEANS, INDIANS, ARABS AND AFRICANS.

No.	Nationality.	Number of Notices sent.	Percentage of Contribution.
1	European ..	16	9.47
2	Indian	89	52.66
3	Arab	10	5.92
4	African	54	31.95
Total number of Notices ..		169.	

The above notices refer to :—

24 collections of anopheline mosquitoes found (larvæ).

142 „ culex mosquitoes found (larvæ).

30 „ stegomyia mosquitoes found (larvæ).

The difference between the number of notices sent, *i.e.* (169), and the actual number of collections found, *i.e.* (196), is explained by the fact that in several cases throughout the year culex and stegomyia were found breeding in the same receptacle, and in other instances anopheline and culex were found breeding together in one receptacle.

Mosquito Breeding in Rocks.—Inspections made in the rocks surrounding Mwanza proved that mosquitoes breed in considerable numbers in the natural hollows in the rocks. Several collections were found and the hollows were filled in or treated with oil as circumstances permitted. It is considered impossible, however, completely to prevent mosquito breeding in rocks as many of the breeding places are unassailable. Europeans who live in the areas surrounded by rocks have complained of heavy infestation by mosquitoes. On investigation these proved to be of the culex variety.

Special Areas in which Anophelene Mosquitoes Breed and which receives Special Attention.—The main anopheline breeding area is to the west of the new railway station. Anopheline mosquitoes breed to a smaller extent in the following places :—

Kartusi area to the north-east of the township.

Kirumba lake shore and adjacent shambas.

Marenga stream and Rufiji Road drain.

These areas are dealt with by oiling every fifth day, keeping grass clear from large pools, clearing drains and filling in where practicable.

Thirty-eight and one-third gallons of kerosine oil was used during the year. This was used, mixed with castor oil (1 per cent. solution), and proved very effective.

General opinion regards Mwanza as being particularly free from mosquitoes, considering the enormous breeding ground afforded by large supplies of fresh water in pools and the proximity of the fresh-water lake. As a consequence of the above activities it was gratifying to note a considerable fall in the anopheline curve for the year 1928.

Six mosquito finders were employed during the year, and although it was found necessary to make occasional changes the old trained mosquito finders were retained.

The following is a table showing anti-mosquito work done during the year 1928:—

Number of Collections of Larvæ found—									
A. . . . .	..	..	..	..	..	..	..	..	723
C. . . . .	..	..	..	..	..	..	..	..	539
S. . . . .	..	..	..	..	..	..	..	..	5
Number of Drains—									
Inspected	..	..	..	..	..	..	..	..	605
Oiled	..	..	..	..	..	..	..	..	294
Number of Cesspits—									
Inspected	..	..	..	..	..	..	..	..	49,814
Oiled	..	..	..	..	..	..	..	..	—
Number of Pools—									
Inspected	..	..	..	..	..	..	..	..	1,213
Oiled	..	..	..	..	..	..	..	..	692
Number of Wells—									
Inspected	..	..	..	..	..	..	..	..	925
Oiled	..	..	..	..	..	..	..	..	5
Number of Tanks—									
Inspected	..	..	..	..	..	..	..	..	132,668
Oiled	..	..	..	..	..	..	..	..	—
Total number of Inspections								..	185,225
Total number of Oilings								..	991

MWANZA TOWNSHIP.—METEOROLOGICAL RETURN FOR THE YEAR 1928.

Month.	Maxi- mum.	Mean Maxi- mum.	Mini- mum.	Mean Mini- mum.	Mean Dry Bulb.		Mean Wet Bulb.	
					9 a.m.	2 p.m.	9 a.m.	2 p.m.
January ..	32	29.4	16	17.9	23.9	27.4	22.9	26.9
February ..	32	29.0	15	18.8	23.2	27.5	22.0	26.5
March ..	32	28.7	14	18.0	22.9	27.6	21.2	25.2
April ..	32	27.9	17	18.0	22.1	26.8	20.1	22.9
May ..	29	27.2	16	16.8	22.3	25.6	19.5	22.5
June ..	30	28.3	15	16.6	22.3	27.3	19.6	24.7
July ..	31	28.0	11	15.5	21.3	27.1	19.0	24.2
August ..	31	28.2	15	17.3	21.9	26.9	21.0	25.2
September ..	32	29.7	16	18.3	23.9	27.6	21.6	25.4
October ..	31	28.4	16	18.4	23.7	27.7	20.0	24.3
November ..	32	28.7	17	19.0	24.0	27.6	19.8	22.9
December ..	30	27.0	16	17.9	22.7	26.6	19.8	22.8
	30	28.3	15	17.7	—	—	—	—

MWANZA TOWNSHIP.—RAINFALL RETURNS, 1928.

Month.	Total Rainfall.	Approximate Inches.	Number of days on which rain fell.	Highest rainfall on one day.
	mm.			
January	56.5	2.20	5	25.2
February	70.0	2.75	8	23.7
March	66.5	2.60	12	30.0
April.. .. .	191.0	7.55	18	35.2
May	138.6	5.45	15	35.2
June	21.0	0.85	4	1.2
July	29.5	1.15	1	29.5
August	31.5	1.25	1	31.5
September	41.7	1.65	5	38.1
October	42.5	1.70	10	20.6
November	83.3	3.30	11	40.0
December	115.7	4.55	17	19.9
	887.8	35.00	107	—

Comparative Figures in inches.

1923	45.95	1926	51.20
1924	34.46	1927	31.62
1925	42.48	1928	35.00

German average over 11 years, 39.60.

Sewage Disposal.—This branch of sanitation provided, as previously, a vexed question, due to the inadequacy of the present conservancy system to meet the needs of the Indian community. After much consideration it was decided that a deep-pit type latrine should take the place of the existing insanitary bucket latrine wherever practicable.

This was not generally enforced, however, and much nuisance still exists by reason of the extremely filthy and badly constructed bucket type latrines in the Indian bazaar and elsewhere in the township.

The proprietor of the New Africa Hotel installed a water-carriage system. Complete fittings for two lavatories and two bathrooms were obtained, and iron drain-pipes of 4 in. diameter complete with inspection chamber and cesspit iron covers with grease seal. This has now been fitted up and has functioned well. Ample ventilation has been allowed and pipes carried to a sufficient height. The only important omission was the interceptor trap, which will be provided eventually.

Incineration.—Three incinerators were maintained throughout the year. The old incinerator near the old Native market, which was a source of much nuisance (when burning refuse) to the Boma and the Native market, was demolished and the stones used in banking up the Marenga stream.

Dust-bins.—Dust-bins have been provided by the greater majority of the Asiatic community, but the type is not a good one, as the local makers are not skilled craftsmen and the dust-bins are in most cases rough and ready, but fulfil the purpose to some extent. The "Nesta" dust-bin is a very good type and in fulfilling the purpose of a good dust-bin it also presents a neat appearance on streets, which is a consideration.

Trade Refuse.—Due to the carelessness of traders and business people in the township, considerable nuisance exists due to collections of trade refuse lying all around their premises.

The Nakasero ginnery was an especial offender. The road passing through the ginnery is also the private road to the residence of the Provincial Commissioner. This road was during the cotton season in a very filthy state, and no attempt was made to mitigate the nuisance. Proceedings had, unfortunately, to be taken against the company, and since then the whole ginnery and surroundings have been cleaned.

Congestion leads to increased refuse, both domestic and trade. If and when the relay-out scheme is realized it will be considerably easier to deal with the collection and disposal of refuse.

Disposal Centres.—As suggested in last year's report, a large open banda with concrete floor would be a considerable asset in the dealing with refuse in the rainy season. This would also provide *washing sheds* for latrine buckets and would set the whole work of scavenging on a sound footing.

DRAINAGE.

Little or nothing has been done to improve the practically non-existent drainage system in Mwanza. Ikoma Road, the main street of Mwanza, boasts of a very unsatisfactory drain. The bottom is very bad and mosquitoes have been found breeding in pools formed therein on several occasions. This drain was constructed by the Public Works Department, and is not more than 3 in. to 4 in. in depth. Lack of funds appear to be the reason for the faulty construction.

No other street has any adequate drainage, while most have no drainage system whatsoever. This fact leads to much accumulation of water in the rainy season. Water from compounds must flow somewhere, and one cannot blame a householder if he makes a drain leading from his compound to the street to take away the rain water.

Existing drains were kept clear and sides sloped to induce a flow and to prevent the forming of pools. Several owners of private shambas had some very faulty drainage systems, and these were dealt with in the majority of cases either by insisting that the drains be properly constructed or filled in. The Rufiji drain was, despite the attention paid to it, again a source of anopheline breeding, but these were destroyed in the larval stage.

Some considerable work is given in ridding the open drains of sand, which is carried down from the hills surrounding Mwanza. Culverts choke up in from one month to a month and a half: this is actually due to bad drainage systems. If a new drainage system could be tackled this nuisance (which adds to mosquito breeding considerably) would be obviated.

Routine sanitary inspections were carried out, showing a total of 9,528 for the year. This year a decided improvement was noticed, which was brought about by an increase in the number of soakpits in Indian compounds.

NATIVE HOUSING.

Particular attention was paid to Native housing and the lay-out of new houses. The Sanitary Superintendent gave his personal supervision to every new house built and also to all reconstructions. The type insisted on was a four-roomed house with "sebule" in the centre and half verandah. The rooms were all 12 ft. \times 12 ft. or over. The result of over a year of supervision is a very creditable type of Native house. Windows were also provided except in cases of extreme poverty, when they were allowed to build houses of the "msonge" type outside the town. Several Natives even provided washing-slabs and soakpits.

RAT CATCHING.

There were three rat catchers employed during the year. The catches amounted to 20,368 for the year: that shows a daily catch of some 65 rats. An endeavour was made as from middle of February, 1928, to keep a separate account of each type of rat caught. For that broken period the following are the percentage of the different types trapped:—

<i>Rattus rattus rattus</i>	...	...	...	...	...	...	42·23
<i>Rattus norvegicus</i>	...	...	...	...	...	...	46·16
<i>Abicanthus abbysinicus</i>	...	...	...	...	...	...	11·61

This shows that the black rat is not in predominance. The breakback rat trap proved as previously a very good trap. No cage trapping was tried this year as the type of cage trap available proved very unsatisfactory and a loss of time. The three rat catchers are very efficient, and have kept a good daily average of catches throughout the year.

OFFENSIVE TRADES.

There was no addition to the offensive trades previously reported. Messrs. the Meat Ration Company transferred their business premises from the offensive trades area at Kirumba to the new area at Tabora Road (about two and a half miles from the township). The building is in a very clean condition and the construction up to date, and much better suited for the purpose than the old building at Kirumba.

No other offensive trades exist except those which do not actually come under the true meaning of offensive trade. Hide dealers as apart from hide factor, cause much nuisance in the laying out and counting of hides prior to baling them for transportation to England and elsewhere. This nuisance will be obviated when suitable sites for godowns are ready.

HEALTH REPORT ON THE GOVERNMENT CENTRAL SCHOOL, MWANZA.

One hundred and thirty-two pupils attend the school ; of this number 40 are day boys, leaving a total of 92 boarders.

There are twelve dormitory huts, each with a cubic space of 2,400 cu. ft., that gives a total cubic space of 28,800 cu. ft.

There is free access of fresh air from all sides of the dormitories. During the year the floors of dormitories were cemented which was a decided improvement. The walls were also cemented to a height of 2 ft. Since the floors and walls were cemented very few ticks have been observed. Prior to the cementing of the floors and walls cow dung was smeared on them, and while this prevented ticks it was impossible to have the dormitories washed out. The dormitories are now kept spotless. Each boy has an iron bedstead to sleep on.

There are five class rooms each with a cubic space of 7,200 cu. ft., and two with a cubic space of 5,400 cu. ft. each, giving a total cubic space of 46,800 cu. ft., or an average of 354.54 cu. ft. per pupil.

There are two football grounds, and the pupils play there for one and a half hours every alternate day. They are very keen on football and their play is highly creditable. They have physical drill every day for 15 minutes. In the evening they have a bathing parade, which lasts for 45 minutes. There is also an open-air gymnasium. It will be seen by the above that the recreation of the school is not neglected.

LATRINES.

There are 14 deep-pit latrines used by the boys ; that works out at a latrine for each 10 boys, which is ample. The latrines work very well, and fly breeding has been reduced to a minimum, due to careful supervision. The boys urinate into soakpits through a perforated kerosene tin.

SUMMARY OF TOWNSHIP AUTHORITY WORK IN MWANZA DURING THE YEAR 1928.

The Township Authority is constituted as follows :—

<i>President</i>	..	..	..	..	The District Officer.
<i>Executive Officer</i>	..	..	..	..	The Sanitation Officer.
<i>Members</i>	..	..	..	..	{ The Executive Engineer. The Staff Surveyor.
<i>Members (non-Official)</i>	..	..	..	..
					{ One European. One Indian.

Twenty-five meetings were held during the year and 31 files were opened. The following permits were issued during the year :—

Permits to erect new European houses	..	..	..	..	..	Nil
Permits to erect new Asiatic houses	..	..	..	..	..	5
Permits to erect new Native houses	..	..	..	..	..	27
Permits for reconstruction (European houses)	..	..	..	..	..	9
Permits for reconstruction (Asiatic houses)	..	..	..	..	..	91
Permits to reconstruct Native houses	..	..	..	..	..	158
Permits to construct latrines	..	..	..	..	..	73
Permits to construct fences	..	..	..	..	..	115

The following important items of business came before the Township Authority during the year.

1. A site was selected for the new Native market. The market is now nearly completed and it is hoped to transfer the present market early this year. In course of time this action will help to minimize the congestion in the Indian bazaar.
2. The new lay-out scheme. This was accepted by the Township Authority.
3. A site was selected for godowns for storage of hides, etc. A plan of the site was drawn up by the Staff Surveyor.

There are numerous accurate plans of the township.

Food Inspection.—Daily inspections were carried out at the Native market and periodic inspections at the local stores to determine the condition of tinned foodstuffs.

MARKETS.

The new market in Shaurmoyo Road is now completed, but it has not yet been opened. The roads required to open up the proposed trading sites have not yet been made by the Public Works Department, and this, of course, prevents the Indian trading community from transferring their trading premises to the new market area. When the sites are ready the new market will be opened. The old Native market was kept in as good condition as possible, but the construction was very bad and entirely unsuited for the sale of foodstuffs, which in many cases have to be placed on the ground. The new market will obviate this.

SODA AND ICE FACTORIES.

There are three soda factories in the township. These are being run on fairly satisfactory basis. All water is first boiled and then filtered; several complaints, accompanied with samples of soda purchased, were received during the year. On investigation it was discovered that the soda was being made very cleanly and the only remaining cause was that the washing boys were washing the bottles carelessly. They were informed of the great care which must be taken to ensure that all bottles were properly washed, and since that time no further complaints have been received.

A new up-to-date ice plant has been installed in Mwanza. The fittings are of the latest type. The water supply is not at the moment of the best, as it is being pumped from a well which is not giving clean water, but time will rectify that.

MILK INSPECTION.

The inspection of milk proved somewhat disappointing. The Natives come from some considerable distance with their milk. When given a permit to sell milk, this permit is either lost or thrown away, as it is impossible to account for half the permits issued. Several members of one family take turns in bringing milk for sale, and when a particularly "watered" variety is detected, the seller pleads ignorance of the requirements of the existing laws and always affirms that it is his or her first appearance in town selling milk. It is very difficult to get a conviction, as the lactometer test is not considered sufficient proof, and it is impossible to have milk analysed. A central control selling station would, perhaps, meet the needs of the community, but that would not be very easily brought about with the Mwanza Native.

One prosecution was made and a conviction obtained.

PORT HEALTH WORK.

During the year 1928, 64 steamers were boarded and 1,260 dhows.

No case of infectious disease was observed during the year.

During the plague epidemic at Musoma special precautions were taken to prevent the introduction of this disease to Mwanza.

The pier at Mwanza during the cotton season is one mass of baled cotton and bags of cotton seeds. These bales sometimes remain there for at least three weeks. These bales must afford considerable attraction for rats, and I think it is time that proper rat-proof godowns were built at the pier.

The great difficulty with Mwanza is that there appears to be no room to build anything without first pulling down an existing building. I think it is of paramount importance that no rat-attracting material should be allowed to lie on the pier at Mwanza.

While on the subject of cotton I may mention that Mwanza is very unfortunate in having a ginnery in its midst. Besides being an annoyance at night it is a source of rat infestation. No proper rat-proof godowns are provided, and according to the Senior Agricultural Officer, Mwanza, he cannot compel them to build rat-proof godowns, as they were established before the new Cotton Ordinance came into existence. I did not agree with him, however, and consider that every effort should be made during the forthcoming year to compel them to build rat-proof godowns. This can be accomplished by means of the Rat Proofing of Buildings Township Ordinance, 1927.

EXTRACT OF A REPORT ON THE PUBLIC HEALTH OF LINDI FOR THE YEAR 1928.

BY DR. K. EDMUNDSON, M.B., CH.B., HEALTH OFFICER, LINDI.

SANITATION REPORT, 1928.—LINDI TOWNSHIP.

Administrative Staff.—The sanitation staff averages 53, made up as follows:—

EUROPEAN—							
Sanitation Officer	..	..	..	..	..	..	1
Sanitary Superintendent	..	..	..	..	..	..	1
NATIVE—							
Urban Sanitary Inspector	..	..	..	..	..	..	1
Headman	..	..	..	..	..	..	1
Messenger	..	..	..	..	..	..	1
Mosquito Finders	..	..	..	..	..	..	5
Rat Catchers	..	..	..	..	..	..	2
Latrine labourers	..	..	..	..	..	..	9
General labourers	..	..	..	..	..	..	32
							—
							53
							—

There were no changes in European staff.

HYGIENE AND SANITATION.

GENERAL REVIEW OF WORK DONE AND PROGRESS MADE.

Preventive Measures.

Mosquito-borne Diseases.

Drainage.—Some of the old surface drains were regraded and additional ones laid during the latter half of the year (*see* “*Drainage*”), which has resulted in the elimination of many swampy areas.

There are, however, two large depressions at the northern end of the township which, during the rains, are quickly converted into large lakes. The surface drainage scheme does not embrace these, and large quantities of kerosene have to be expended in order to prevent mosquito breeding. Waste engine oil from the pumping station is mixed with the kerosene when available, and is found very effective.

Closing of Wells.—Since the installation of the pipe-line water supply orders have been given for the closing of over 60 insanitary private wells which were formerly responsible for the breeding of mosquito larvæ. No further permits to dig wells in compounds have since been granted, and a large proportion of the remaining wells have now been rendered mosquito proof, and larvæ are now rarely found.

House Inspection.—There are approximately 1,100 houses in the township, and these are regularly and systematically inspected by the mosquito finders and the Urban Sanitary Inspector.

50,198 premises were searched, so that each house is inspected on an average once weekly.

The total collections of larvæ were as follows :—

								Per cent.
Anopheline	..	..	..	..	..	..	90	8·05
Culex	..	..	..	..	..	..	352	31·52
Stegomyia	..	..	..	..	..	..	675	60·43
Total	..	..	..	..	..	..	1,117	

Analysis of Collections for 1928 :—

				Anopheline.	Stegomyia.	Culex.
Household receptacles	..	..	..	2	485	107
Casual water	..	..	..	84	130	190
In wells	..	..	..	4	38	27
In pits	..	..	..	—	22	28
				90	675	352

Most of the anopheline larvæ were found in the swamps on the outskirts of the township well outside the inhabited area, whilst improperly graded drains and flooded areas were responsible for over one-half of the culex larvæ. Over 70 per cent. of the stegomyia larvæ were found in household receptacles used for water storage. Many collections were also found in steps cut in cocoanut trees.

Prosecutions.—Twelve prosecutions were undertaken, resulting in a conviction in each case.

Fly-borne Diseases.—During the rains flies have been numerous, largely due to the difficulty of quickly disposing of the refuse of the town. The incinerators are of a temporary and primitive nature, and quite inadequate during heavy rain. Sanitation labour was employed on Sundays during the rainy season in an effort to dispose of the accumulated refuse.

All the principal streets and many of the side streets are now provided with covered dust-bins, whilst the P.W.D. has supplied covered bins to all Government quarters during the year.

All dust-bins are emptied once daily, those in the vicinity of markets where a large amount of refuse is thrown out being cleared twice and sometimes thrice daily.

There are approximately 120 pit latrines in the township, chiefly in the Indian quarter, which are regularly inspected for fly-maggots, of which 112 collections were found.

Epidemic Diseases.

Plague.—No cases have occurred during the year. Rat-catching is carried out regularly, sections of the township being dealt with in turn. Two rat-catchers are employed, and 60–100 traps are baited daily.

Barium bicarbonate poison, with instructions for use, has been issued to District Officers and local residents on request.

Dried “Muhogo” bait has been found the most satisfactory. During the year 7,122 rats were killed in Lindi and district, all the rats in the township being “*Rattus rattus*.”

Efforts were made to induce chiefs of districts to organize rat hunts under the supervision of the District Sanitary Inspectors, but only in one case was this carried out with successful results.

Smallpox.—No cases have occurred during the year. In August the African District Sanitary Inspector at Mchinga reported three cases, the Sanitary Superintendent made

a safari to the district and found a few cases only of chicken-pox. Epidemics of the latter have occurred in the districts at various times and isolation camps were built in most cases.

Vaccinations.				Number Vaccinated.	Number Inspected.	Number Successful.	Number Unsuccessful.
Lindi Town	..	..	..	945	418	197	221
„ District	..	..	..	3,247	2,801	1,762	1,039
				4,192	3,219	1,959	1,260

Relapsing Fever.—Following a report by the Commissioner of Police that ticks were prevalent in the police lines at Masasi, the Sanitary Superintendent proceeded there on the 7th October to investigate. Every hut was found to be infested with *Ornithodoros moubata*, some very heavily.

Blood films of sick askaris were taken, but no parasites were found on the slides.

It was recommended that all the huts be demolished and permanent dwellings erected on another site. The police were assembled and instructed in prophylactic measures to be taken pending the erection of new quarters.

The village of Kitungali, 20 miles from Newala, was also found to be infested with *Ornithodoros moubata*. One European from Lindi, who had passed through the village, previously contracted relapsing fever.

Water-borne Diseases.—All drinking water supplies are regularly inspected. As before mentioned, advantage has been taken of the installation of the pipe-line water supply to close insanitary wells, many of which were too close to pit latrines. When granting permits to dig pit latrines the proximity of wells is first ascertained.

It is hoped that all public wells will be fitted with pumps during 1929 to eliminate the danger of pollution through the use of dirty vessels in drawing water.

Water used for the manufacture of soda water and bread is taken from the pipe-line supply, being boiled in the first case.

Deficiency Diseases.—These diseases are not common in the township, fruit, fish and native vegetables being plentiful and cheap. Every opportunity has been taken to impress Natives of the district of the importance of a suitable varied diet.

GENERAL MEASURES OF SANITATION.

Sewage Disposal.—The public latrines, five in number, are all on the pan system. There is only one permanent structure which is constructed of stone, with a concrete floor suitably drained and a corrugated iron roof. There are 56 pans in use here, each one being in a separate compartment with dwarf walls. The remaining four are merely rough corrugated iron structures open to the weather and without impervious floors or drainage.

In view of the periodic prevalence of flies and the difficulty of maintaining these temporary latrines in a sanitary condition, the provision of funds during 1929 for the construction of more satisfactory latrines cannot be too strongly urged.

Eight latrine boys are employed in collecting and burying the faeces at selected spots outside the township. Considerable difficulty is experienced in obtaining labour for this work, high wages being offered, and generally the boys engaged are of an undesirable type, necessitating the constant and careful supervision of their work.

One of these labourers was convicted for burying the faeces in an unauthorized place a few inches below the surface.

All Government quarters were provided during the year with fly-proof pails, these being cleared twice daily.

There are in addition about 100 pit latrines in the town, these being chiefly in the Indian quarter, and these are frequently inspected as potential breeding places for flies. Over half the fly-maggots found were from these latrines.

Refuse Disposal.—Three carts are used for collecting refuse. All Government quarters have been provided with covered dust-bins, and all the main streets and many of the side streets have had similar bins placed in them by this department. Very few Indians or Natives provide themselves with sanitary dust-bins.

There are four temporary incinerators erected in the town for the burning of refuse. These are constructed of old railway metals and, as mentioned before, are quite inadequate during the rains owing to the lack of a drying shed. Consequently refuse steadily accumulates in the vicinity during bad weather, forming a breeding place for flies.

The provision of a stone or other form of permanent forced draught incinerator, with drying shed attached, capable of burning two or three tons of refuse daily, is essential in the interest of public health.

During the year 7,419 loads of refuse have been collected and burnt.

Drainage (Surface).—During the latter half of the year some of the old surface drains were regraded and additional ones built. It was not found possible to complete the whole system owing to lack of funds. It is hoped that this will be done early in the next financial year.

The system proved very effective during the recent heavy rains, flood water in the township being quickly disposed of.

Large quantities of sand, however, were washed into the drains, necessitating several days' work to clear them.

It is unfortunate that only the Market Avenue section is built entirely of stone concrete. The remaining sections are either earth drains with a shallow stone invert roughly laid in cement, or merely earth drains, and it is already obvious that after exceptional rains much damage will be caused. Already many of the stones have been displaced, and one section of over 100 yards has been entirely washed away. A more permanent system is necessary.

Subsoil Drainage.—There is none in the town.

Water Supply.—The pipe-line water supply was completed early in the year—there are three stand-pipes in the streets for general use, and the hospital and most of the Government houses are also connected.

Applications have been received from non-official residents for branch pipes to be connected to their houses, but up to the present this has not been done.

The water is pumped by means of an oil engine from two shallow wells (each yielding 720 gallons per hour) to a supply tank of 2,400 gallons capacity, situated on the hill to the west of the food market. The water at first was somewhat discoloured, due to the use of old pipes internally rusty, but these impurities gradually disappeared.

As before mentioned, many insanitary wells have been closed, and it is hoped to close many more as the pipe line is extended.

Conviction.—One man was convicted and fined for failing to fill in an insanitary well after notice.

Offensive Trades.—Two persons only are engaged in offensive trades in the township, one having machinery for the grinding of simsim, etc., and the other having a cattle oil mill.

The former, whose premises are in the centre of the town, has already submitted plans for the erection of new premises outside the inhabited area.

There is one ginnery in the township, and the stores attached are frequently inspected, as also are premises used for the storage of hides, grain, etc.

Clearance of Bush and Undergrowth.—This work is carried out regularly throughout the year. During the months of March and April this department was unable to deal with the rapidly growing grass outside the Native area and assistance was obtained from the District Officer. An additional vote having been granted for sanitary labour, this will be unnecessary this year.

Number of square yards of grass and bush cut, 1,032,500.

Sanitary Inspections.—Regular and systematic sanitary inspection of the township has been carried out daily by the Sanitary Superintendent and the African Urban Sanitary Inspector.

Number of houses in township (approximate)	1,100
Number of houses inspected during year	10,740
Average number of houses inspected per month	895
Number of inspections per house per year	9·7
Nuisances recorded	2,169
Notices served for insanitary conditions	440
Prosecutions for insanitary premises	16
Convictions (including mosquito larvæ)	16

School Hygiene.—There is only one small Indian school in Lindi, for about 20 pupils, and the sanitary condition of the premises is fair.

Six pupils were vaccinated during the year.

Application has been received for the alteration and extension of the premises.

Labour Conditions.—These are generally good. The Sanitary Superintendent paid brief visits to labour camps whenever possible during his safaris and gave advice on sanitary matters. The huts in some of the Indian-owned plantations were found to be somewhat overcrowded and latrine accommodation insufficient, indiscriminate defæcation with all its attendant evils being common. This was pointed out to owners or managers, who promised to remedy these nuisances.

With the arrival of a Sanitation Officer, it will now be possible to arrange more frequent inspections of these labour centres.

Housing and Town Planning.—The Sanitary Superintendent has personally chosen and marked out plots for Native houses, and supervises the construction and repair of all buildings.

The following permits to build have been granted :—

To build Native huts	55
To build houses (Western standard)	1
To repair Native huts	447
To repair stone houses	31
Demolition orders	10

Township Authority.—Consists of the District Officer as President and the Medical Officer (now the Sanitation Officer) as Executive Officer.

No meetings were held during the year, all business being carried on by correspondence.

A blue-print plan of the township is kept and all items of sanitary interest marked thereon from time to time.

Facilities for Recreation.—For Europeans. Good tennis court and seven-hole golf course, and flat sandy beach from which to bathe.

For Indians. A good concrete tennis court.

The tennis courts and golf course are constantly used, and bathing parties are frequently arranged by the Europeans.

The police askaris frequently play football against Native teams on a flat stretch of sand which is very suitable for the purpose at low tide.

Food in Relation to Health and Disease. (a) *Meat.*—All animals are inspected before slaughter and the carcass inspected before sale.

There is no abattoir in the township, the cattle being killed on the seashore some distance from the inhabited area, whilst the sheep and goats are killed in the compounds of owners. The provision of a public slaughter-house would greatly facilitate the supervision of this source of food supply.

The meat generally is poor in quality, and slaughter and dressing by unskilled men does not improve it.

The diseases chiefly met with are lung congestion and abscesses and occasionally liver flukes and cysticercus bovis. One bullock was heavily infected with the latter disease and the entire carcass was condemned and burnt.

Number of oxen killed	..	..	..	..	..	..	..	19
Number of sheep and goats killed	..	..	..	..	..	..	..	236

All cattle imported by sea are inspected either on board ship or immediately on landing.

All persons exporting hides or skins first obtain a certificate of freedom from disease from this office.

Food Markets.—There are two, one for the sale of fish, and the other for the sale of fruit and vegetables. These are both inspected daily and regular inspection of food exposed for sale in the bazaars is also carried out. Quantities of food have been condemned during the year, chiefly unsound fruit (fresh and tinned), cereals which were “weevilly,” dried and smoked fish which had become decomposed, tinned milk, etc.

The largest consignment of food seized at one time was 600 kilogrammes of mtama exposed for sale in the canteen of the police lines.

Bread.—There is one bakery only in the township, which is regularly inspected.

Aerated Water.—There is one factory which uses the water from the pipe-line supply, the water being boiled prior to use.

The Natives employed in this factory and the bakery now submit themselves to medical examination once monthly.

Milk.—No premises in the township are devoted entirely or partially to the sale of milk. Owners of milk cows either use the milk themselves or are allowed to deliver it at the houses of regular customers.

Three new cowsheds have been built during the year and, with three exceptions, all cattle, sheep and goats are now kept outside the inhabited area. These three owners have already received notices to remove the animals outside the township before 31st March, 1929.

Two convictions were secured against Indians for keeping animals without a licence.

The cowsheds are regularly inspected and already (1929) two convictions have been secured against owners of cowsheds which were found in an insanitary condition.

Measures taken to spread the knowledge of Hygiene and Sanitation.—During the months of August, September and October, Mr. Bailey, the Sanitary Superintendent, undertook safaris to all stations in the Lindi District where African District Sanitary Inspectors are posted, in order to direct and supplement their efforts in spreading health knowledge.

At each village visited the chief was forewarned to gather as many Natives as possible, and assemblies varying between 50 and 500 were given lectures on simple sanitation and hygiene with special reference to local conditions. At the conclusion of the lectures questions were asked and answered.

Special efforts were made to obtain the interest and sympathy of the chief, so much depending on his influence.

Training of Sanitary Personnel.—No further courses of training for District Sanitary Inspectors have been held.

Tribal Dressers.—Five tribal dressers were given a course of instruction in sanitation during the latter part of the year, which consisted of a course of twenty lectures by the

Sanitary Superintendent, supplemented by demonstrations and actual observation of the routine work of the sanitary gangs.

Port Health Work and Administration.—No infectious diseases occurred on board ships entering this port and no vessels arrived from infected ports.

Vessels cleared during the year :—

Sailing vessels	..	..	..	..	..	..	..	160
Mechanically propelled	..	..	..	..	..	..	..	87

TONNAGE TABLE.

				1926.	1927.	1928.
Sailing vessels—						
Number	..	..	..	167	154	160
Net tonnage	..	..	..	3,418	3,455	4,076
Mechanically-propelled vessels—						
Number	..	..	..	48	62	87
Net tonnage	..	..	..	94,017	121,890	124,289

Prisons.—The general sanitary condition of the prison is good. The pan latrine system is in use, the contents of the pans being buried by convicts at authorized places under the supervision of the Sanitation Department.

Refuse Disposal.—All refuse is placed daily in sanitary dust-bins outside the gaol, from whence it is conveyed by sanitation labourers of this department to the incinerator.

The soakage pits, which formerly received the washing and bath waste, have now been abolished, owing to the nuisance which arose when the pits became clogged and overflowed.

All waste water now flows direct to the sea by a concrete open drain which has been recently constructed by the Public Works Department.

The drain can be kept in a sanitary condition, and is an improvement on the old system.

Water Supply.—Water is pumped from a well (covered) to a supply tank fitted on a concrete pillar 12 ft. high, and the supply has been generally satisfactory.

METEOROLOGICAL RETURNS, 1928.

Month,	Temperature (Centigrade).				Rainfall. Amount in inches.
	Shade, Maximum.	Shade, Minimum.	Range.	Mean.	
January	34	23	11	27.7	10.7
February	34	22	12	27.7	4.9
March	34	22	12	27.2	6.4
April	33.5	22	11.5	27.5	4.8
May	34	18	16	26	0.7
June	31	16	15	24.6	0.5
July	31.5	14.5	17	23.5	—
August	32	16	16	23.8	—
September	30.5	18.5	12	24.3	0.2
October	30.5	18	12.5	25.0	0.8
November	30.5	21	9.5	26.2	1.2
December	32.5	21	11.5	27.0	8.5
				TOTAL ..	38.7

IV.—PORT HEALTH WORK AND ADMINISTRATION.

The quarantine station for the sea ports of the Tanganyika Territory is at Zanzibar, and is well organized and equipped. During the greater part of the year there were two qualified Health Officers at Dar-es-Salaam and one at Tanga. An additional Acting Health Officer at Dar-es-Salaam and another at Mwanza. Medical Officers function as such at Bukoba, Kigoma and Lindi; Sub-Assistant Surgeons at Kilwa, Pangani, Bagamoyo, Mikindani, Mafia and Musoma. It is the intention, when qualified staff is available, to post Health Officers at Kigoma, Mwanza and Lindi. There were no circumstances which required quarantine measures of any importance.

The total numbers of steamers and dhows given pratique during the year at the different ports was as follows :—

Stations.	Steamers.			Dhows.		
	1926.	1927.	1928.	1926.	1927.	1928.
Dar-es-Salaam	362	480	558	803	1,738	2,290
Tanga	243	283	357	797	864	674
Lindi	46	62	88	169	154	146
Kilwa	23	33	36	178	145	145
Pangani	25	46	109	283	250	235
Bagamoyo	1	1	2	466	402	685
Mikindani	19	31	54	162	151	151
Mafia	23	33	41	224	202	205
Kigoma	126	155	177	21	24	27
Mwanza	66	71	64	863	90	1,262
Bukoba	63	63	71	2	1	—
Musoma	61	62	65	48	87	187
Mwaya (Lake Nyasa)	—	23	18	—	20	13
TOTAL.. .. .	1,058	1,343	1,640	4,016	4,128	6,020

V.—MATERNITY AND CHILD WELFARE.

Progress is maintained at the Dar-es-Salaam, Tanga, Tabora, Machame and Kahama Clinics. New clinics were opened at Mwanza and Nzega towards the end of the year. All the above are in the charge of qualified Health Visitors.

The scope of the work in the Kahama district has been extended and a clinic has been established near the hospital at Itaranganya, where an Indian Sub-Assistant Surgeon is stationed.

Dr. Maynard's clinic at Shinyanga continues to attract large numbers of women, who sometimes journey long distances to seek her advice and help during their confinements.

During the year six Health Visitors were engaged by the Church Missionary Society for work in the Dodoma district. The Government contributes a sum of £900 towards their salaries. They have already made an excellent beginning.

As a consequence of these activities, a substantial amount of work has been performed, as may be gathered from the table below:—

	1925.	1926.	1927.	1928.
Visits paid by Health Visitor—				
To new birth and other conditions ..	2,018	3,702	7,354	7,807
Mothers admitted to clinics—				
In ante-natal state	—	3	57	564
For confinement	—	21	507	1,654
In post-natal state	—	13	162	992
Ante-natal examinations	—	—	1,131	1,019
Total number of new births	—	—	562	449
Total number of confinements, still-births, premature births, etc.	—	—	1,191	2,019
Children admitted to clinic	—	36	183	272
Total number of new cases, in- and out- patients, seen at clinics—				
Mothers	—	2,506	10,736	16,686
Children	4,207	4,224	16,515	24,870
Total number of attendances at clinics—				
Mothers	—	6,164	27,745	74,340
Children	—	12,924	36,725	90,747
Special examinations, dental slides, etc. ..	—	2,114	10,071	—

The table was compiled by Dr. Madeleine Harvey Clarke, Medical Officer in Charge of the Maternity and Child Welfare Clinic, Dar-es-Salaam.

No reliable Infant Mortality Rate figures are available, but it is conceded generally that they are high. An interesting note by the Medical Officer, Iringa, may be referred to on page 198. Experiences of this nature are, unfortunately, far too common, and the remedy lies in increasing the numbers of Maternity and Child Welfare Clinics as widely as possible.

ANNUAL REPORT OF KAHAMA DISTRICT CLINICS AND WELFARE CENTRES WITH AUXILIARY TREATMENT BASES, 1928.

BY DR. A. R. LESTER, MEDICAL OFFICER IN CHARGE, M.B., B.S. (BOMBAY), F.R.F.P. & S.
(GLAS.), D.P.H. (EDIN.), D.T.M. & H. (EDIN.).

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The work of the Epidemiological Survey in this district has been considerably extended and augmented in the year under review.

The increase in activity is not strictly comparable with previous efforts, as it was with Kahama Clinic alone that last year's report dealt. This deals with all clinics, welfare centres and hospitals, which operate in the area.

There are now two Clinics at Kahama and Runzewe, two Welfare Centres at Itaranganya and Uyogo, one Native General Hospital at Kahama, two Native Authority Hospitals at Runzewe and Ushirombo, and two Sleeping Sickness Hospitals at Masumbwe and Ushirombo in being. Five of these were opened this year.

A brief recapitulation of the positions and areas served by these centres, may here be useful.

Kahama is the north-western district of the four which comprise the Province of Tabora. Eleven sultanates are contained in the district, and these have been so grouped for administrative purposes as to form four areas named after their position in regard to the compass.

The eastern area—Kahama sultanate itself—is served by a Native General Hospital and a Clinic, the latter catering for women and children alone.

Three sultanates are served by the Welfare Centre at Uyogo, in the south, three by the Clinic and Native Authority Hospital at Runzewe in the west, and four by the Welfare Centre at Itaranganya in the north. A Native Authority Hospital opened previously at Ushirombo for the benefit of the Natives of the western area, continues its work.

Following the discovery of sleeping sickness in the early part of the year in the district, two hospitals were opened at Masumbwe and Ushirombo.

STAFF.

For varying periods, the European staff of the district clinics has consisted of three medical officers, including a lady doctor, and three nursing sisters and health visitors.

Five Indian sub-assistant surgeons have been attached to the Clinics and Welfare Centres.

Five Native Dispensers and seven African District Sanitary Inspectors work in the district, and each centre has its subordinate personnel as required.

Below are details of the European and Asiatic staff.

Name.	Designation.	Station.	Arrived.	Left.	Remarks.
<i>European Staff.</i>					
A. R. Lester	Medical Officer ..	Kahama ..	16.2.24	—	—
C. Wilcocks	" ..	Runzewe ..	21.8.28	22.2.29	Transferred to Moshi.
F. G. Wilcocks	(Temp.) " ..	" ..	"	"	"
E. L. Kemsley	Senior Nursing Sister	" ..	1.4.25	20.9.29	On leave.
A. L. Ryder	Sister and Health Visitor	Kahama ..	1.4.26	15.3.28	"
B. G. Allardes	" ..	" ..	11.3.28	—	—
<i>Asiatic Staff.</i>					
Harcharan Singh ..	Sub-Assistant Surgeon	Runzewe ..	15.1.26	—	—
Basant Singh	" ..	Uyogo ..	26.5.26	—	—
Jagat Singh	" ..	Itaranganya ..	29.9.27	—	—
N. C. Daniel	" ..	Kahama ..	12.10.27	—	—
R. H. Doshi	" ..	" ..	23.2.28	—	—
Amar Singh	4th Grade Clerk ..	" ..	11.6.28	—	—

The sleeping sickness officer's staff is separate, though mutual help is frequently afforded and close co-operation has been the aim.

Health of Staff.—The health of the European staff has been good. The Asiatic have been less fortunate, and their health has been merely fair. The Native personnel have also kept fair health.

Training.—The sub-assistant surgeons have from time to time been given opportunities to do microscopical work and to recognise the commoner parasites. They have also had a small library of medical and surgical works at their disposal, on which they have drawn as required for reference and revision.

The ayahs—native nurses—have been taught a form of discipline, cleanliness, asepsis, the dressing of wounds and ulcers, consideration for and the care of the sick, and ordinary hospital routine. They have been given instruction in midwifery and every case has been a practical demonstration to them. Danger signals have been emphasized, and the preparations of the lying-in wards they have been taught to anticipate.

This seems scant progress to report, but has been achieved by dint of constant repetition, hard work and perseverance on the part of the sister in charge for the greater part of the year. The achievement marks definite advancement when one considers that the material available has hitherto been densely ignorant middle-aged women, unaccustomed to Europeans, to any systematic manner of work, or to discipline. Uneducated, having little sense of responsibility, a class of whom intelligent anticipation is apparently a painful process, and having superstitious convictions as firm as adamant and old customs difficult of eradication, any change in these women is one for the better, and to accomplish in less than a year the little detailed earlier is no mean performance.

The uneducated raw Native from the district has, in our experience, been better material to handle than those who have been partially trained and left to their own devices for a time after learning a little of reading and writing.

No illusions are entertained that the knowledge the ayahs have slowly imbibed is a permanent store. We have learnt to our discouragement that it is not. It is probably too much to expect at this stage in their training. It is no criterion that while they behave correctly under the personal supervision of the sister in the management of a normal labour, that from laziness or other cause they will not revert to their old practices if left to themselves. It has also been seen that they easily forget a practice if an interval of a week or fortnight were to elapse, during which the necessity for its application did not materialise.

Constant teaching, practice and supervision will continue to be necessary for some time.

FINANCIAL.

The treatment of all Natives is free ; no revenue in consequence accrues to our clinics or welfare centres.

The expenditure for the year shows a great increase on that of last year, when only one clinic was in operation. On page 108 is set out in tabular form the main expenses incurred. The table concerns the clinics and welfare centres alone and excludes the salaries, etc., of European officials.

COMMUNICATIONS.

This subject was dilated upon to some extent in the last report.

The main road passing through the district—the Tabora–Bukoba road—the connecting link from the railway to the District Headquarters—Isaka to Kahama, and all the roads in the township of Kahama have received attention to the limit of the sum voted for them. They have been much improved.

The roads to others of our out-stations are the responsibility of the Native authority through whose domains they pass. Gross obstruction such as boulders, tree stumps and heaps and pits—many of these have to a considerable extent been removed or filled in, improving the amenities of the road for motor traffic.

In all the roads, however, there is room for greater improvement, and none is as yet capable of conveyance of all motor traffic right through the wet season. Ant hills and pits are a recurring nuisance, difficult of permanent eradication, while sand patches, swamps and rocks require radical treatment. This means expenditure, and expenditure on a larger scale. Were the money available and the benefits worth the cost, it would be an economy to vote a larger sum for the improvement of the roads by the provision of stone culverts, the drainage of swamps converging on a road, and the deposition of a layer of red gravel on the surface of parts requiring it. Bridges might also be improved with advantage, as the Native bridges are purely temporary structures.

Provisions for the sick in the various sub-centres have been difficult to obtain, as last year's rainfall was low with long periods of drought. Foodstuffs have been sent out as required by lorry from Kahama. For letters and messages, reliance was placed on the messengers of the chiefs, who from courtesy and the fact that their messengers had to go from each sultanate into Kahama and back from time to time with official missives, permitted this service. An irregular service once or twice a month and sometimes once in two months was thus maintained between Kahama and our welfare centres. A regular weekly service of runners between Kahama and our clinic at Runzewe has been arranged by the administration and is working satisfactorily. Small parcels of drugs, etc., were not permitted to be sent by runners, however, and porters had to be engaged. For several reasons dependence on the courtesy of the chiefs was not found to be altogether satisfactory, so while still using their runners as occasion requires, special cyclist messengers have been engaged for the carriage of parcels or urgent messages.

Every village in the district accessible to a car and many others of any importance in the bush have been visited during the year by the medical officers. These visits are carried further afield by the sub-assistant surgeons, and very few of the smallest settlements in the remotest corners of the bush have not been visited by one or other of the Native dispensers or sanitary inspectors.

TABLE OF EXPENDITURE, 1928.

Stations.	Pay of Sub- Assistant Surgeons.	Pay of Asiatic Clerk.	Pay of African Dispensers.	Pay of African District Sanitary Inspectors.	Pay of Motor Drivers.	Pay of Ayahs.	Maternity and Child Welfare.	Transport.	Travelling Allowance.	Transport Allowances.
Kahama	Shs. 3,295/55	Shs. 1,000/-	Shs. 910/-	Shs. 19/35	Shs. 249/68	Shs. 1,203/97	Shs. 1,635/09	Shs. 2,507/53	Shs. 624/-	Shs. 1,938/83
Runzewe	4,830/97	—	515/74	19/35	—	1,052/50	554/84	for all	1,227/-	411/26
Itaranganya ..	4,620/-	—	420/-	320/-	—	358/-	244/78	the four	54/50	772/25
Uyogo	4,552/-	—	429/74	38/70	—	445/42	178/85	stations	205/-	64/-
	17,298/52	1,000/-	2,275/48	397/40	249/68	3,059/89	2,613/56	2,507/53	2,110/50	3,187/34

Table of Expenditure, 1928—continued.

Stations.	V.D. and Yaws.	Pauper Burials.	Upkeep and Running Cost of Motor Vehicles.	M. & C.W. Ward and Quarters for Attendants.	P.W. Recurrents for Four Garages and Four Petrol Stores.	Railway Fare and Freight.	P.W. Recurrents Repair of Medical Officer's Quarters at Runzewe.
Kahama	Shs. 200/-	Shs. 15/-	Shs. 1,096/62	Shs. —	Shs. 644/91	Shs. —	Shs. —
Runzewe	—	—	—	—	for Kahama and	51/80	166/54
Itaranganya ..	—	—	—	795/40	Itaranganya	—	—
Uyogo	—	—	—	—	stations	—	—
	200/-	15/-	1,096/62	795/40	644/91	51/80	166/54

In all the district medicine has been carried to the sick, and the people have been informed of the existence and objects of the clinics and welfare centres provided for them. They have been advised, too, on the subject of sanitation and hygiene, and in the larger villages there would appear to be some small response to the teachings. Improvements in sanitation are merely suggested. There is, as yet, no compulsion to conform to any standard of sanitation. The improvements involve some little work and, left to his own devices, the Native sees little utility in them or benefit commensurate with the labour entailed. The response is therefore at this stage poor.

VITAL STATISTICS.

Statistics have been collected for the Kahama District—an area of approximately 7,000 square miles with an average altitude of 4,000 feet above sea level.

The district may be looked upon as a plateau from which rise several long low ranges of hills arranged promiscuously, the intervening spaces being taken up with undulating country broken in parts by rocky outcrops and the lowlands, in the rains, being quagmires. At a rough estimate about two-thirds of the area is covered with dense scrub and forest. The open spaces are natural, where the soil is poor and artificial, where men have settled. In many places where from reasons of diminution in the water supply, exhaustion of the soil or other cause, the inhabitants have sought new pastures, the encroachment of the bush is evident. In about seven to ten years the process of reversion to bush is more or less complete, a few ramparts and flattened ridges and furrows and an incomplete palisade of trees being all that remains as evidence of former occupation.

In earlier days, the days of Livingstone and thereabout, it is stated that the population of the country was greater. One or two of the older inhabitants alive to-day, who remembers seeing or hearing of the passage through the country of contemporaries of Livingstone, possibly Stanley and Grant, say that the country was more densely populated then, and that cattle were numerous.

The statements of the Natives in the connection are to be accepted with caution. Those were the days of Mirambo, the Napoleon of these parts, when the inhabitants banded themselves together for protection in large moated enclosures with ramparts and palisades. Parts of the remains of a village so fortified are still to be seen not far from Ushirombo. In these circumstances, it is conceivable that the Native, whose notion of the world extended not many miles beyond his own battlements, was constrained to consider that world crowded.

With internecine strife, predatory invasions, the ravages of disease among man and cattle, impoverishment of the soil and other causes, their numbers are reported to have dwindled. Any actual diminution from these causes appeared to have been assisted by the establishment of foreign domination and greater security for the Natives. For, with peace abroad, the inhabitants scattered over the country as much to secure new holdings of greater promise, as to escape from the harassments and petty tyrannies of their chiefs and sub-chiefs. Bush villages were thus formed, from which in turn extensions proceeded.

It is among a diffuse population of this nature that endeavours have been made to collect information as to their number, and the manner of collection of data which must perforce be adopted explains why doubt as to their strict accuracy is still entertained.

The procedure of census taking is here described.

A meeting of chiefs and sub-chiefs is arranged in local headquarters by the Administration. The meaning and objects of a census are explained, and opinions invited as to the time most suitable for the project, the considerations of weather, minimum interference with the ordinary avocations of the inhabitants, and the likelihood of the greater number ordinarily belonging to the district being present in it, are duly emphasised. April is the month usually chosen as answering these considerations.

A date is then to be settled upon, not according to the European calendar, which is little understood, but in relation to some prominent phase of the moon—usually the full.

This decided, a detailed explanation is entered into, through an interpreter, of the information required for the general census and the method of computation. This is further explained by the sultans on their return, to the heads of villages and settlements, who are the actual counters. Too much detail would put a strain on their mental capacity, that would result in confusion. Our inquiries are therefore limited to the counting of male and female children under a year of age, and males and females over this age, separately. As many of the chiefs and almost all their sub-chiefs and headmen are unable to count with any accuracy, pieces of string of different colours, each denoting an age group and sex, are distributed. A knot is tied in the appropriate coloured string for each person passing the counter in parade. The day after the census each counter takes his four strings to the clerk of the chief, who ties them together and labels them. As early as possible after all have been brought in, the strings from each sultanate are sent into Kahama, where the knots are counted, checked, and information tabulated.

A few obvious sources of error in this method of computation are immediately apparent. It is, however, the best at present possible.

Special censuses of certain well-defined and more compact areas within the district have been taken by a trained Native census clerk, under supervision.

In these areas, attempts have been made to obtain more detailed information, but in the absence of definite data, ages have had to be intelligently gauged. While there are fallacies apparent in this, it is not improbable that superenumeration in one age or age group is equalized by an under-count in others. The results obtained by these methods bear no pretence to strict accuracy, but are presented as merely approximating to it.

Births and deaths are now registered within a short period of their occurrence to the clerks of the chiefs, and these figures are reported monthly.

From the middle of the year a numbered metal disc—tin or brass, according to sex—was issued to the mother of each child born alive, with instructions that the disc was to be returned immediately should the child die within a year. This procedure was instituted on the suggestion of the District Officer, as constituting a double check on returns.

In the following tables are shown the totals of population of each sultanate, according to sex. Children under a year have been specially enumerated. The total estimated population for 1926 is given for comparison, and differences between the two. It will be noted that the population of Usumbwa, the largest sultanate in point of area, was, from erroneous information supplied, entered as 7,000 souls in the last report. This has been corrected, and the general totals are unaffected, since it was considered that "a margin of error" of about 1,000 per chieftdom in the aggregate had been allowed. The error was due to an omission in the map setting forth populations of each district. It is to be remarked that figures for 1926 and 1928 coincide in the case of three sultanates; in five instances the estimated figures are in excess to the extent of 1,100 in total, and in three are deficient to the extent of 4,000. No inferences can be drawn as to increase or decrease of population from these figures, as the earlier ones were estimated by multiplying the number of taxpayers by a factor of convenience. The results approximate to an actual count, but cannot be verified.

The total population of the district in round numbers is 80,000. The table supplies details. It is observed that females predominate to the extent of 8,400 over the males, or an excess of 234 per 1,000 males. The disparity in numbers between living male and female children in the first year of life is not so marked.

Record has been kept of the births and deaths occurring in each sultanate of the district, according to sex. It has been impossible to go into details of age groups in reference to the latter other than to separate infant from other deaths, all over a year being included among adult deaths. Still-births are separate.

Two thousand two hundred and forty-three births were registered in 1928 as against 1,855 in the previous year, an increase of 388. Three still-births in excess of the previous year were notified, the figures being 42 and 45. Deaths under a year of age increased this

year from 566 to 659, a difference of 93, while deaths of persons over a year of age were 338 more than for 1927.

The general increase in figures of both births and deaths may and probably do mean little more than improvement in registration, reports of either being more consistently brought in than formerly. The adventitious influence of the sleeping sickness epidemic is also to be borne in mind.

There are in excess of the total deaths tabulated 204, which have occurred in the various hospitals, clinics and welfare centres, unaccounted for. In some few instances these have possibly been registered by friends of deceased, and in others not. Forty-four of these deaths were among males, and 67 females, making a total of 111. Ninety-three deaths from sleeping sickness have not been accounted for in relation to sex. In this connection, arrangements are being made that all deaths taking place in hospitals, etc., will also be registered in the chief's books.

In addition to the figures obtained from the general census, three special censuses with nominal rolls and an attempt at division into age groups were taken in three areas diversely situated in the district. The areas were chosen as their boundaries were well defined by roads in two instances and by a spirit of pride of race in the third. The third was the sultanate of Ungoni, insular in position, in the heart of Usumbwa. No one who is not of the clan claims relationship to it, while members of the clan themselves are proud, with reason, to advance their claim. No great difficulty of differentiation of Wangoni from Wasumbwa was therefore expected to be experienced.

1. The first such area chosen lay in a triangle in the Northern zone, bounded by roads joining Itaranganya, Lunguya and Shibutwe, called for convenience the Itarlungutwe triangle. The area enclosed is about 15 square miles, and portions of three sultanates overlap into it. In this experiment we endeavoured to obtain statistics as to sex, age groups under one year, over one and up to 15, and over 15 years of age; huts were also counted.

Later in the year, a second nominal count in an attempt to obtain more precise information in regard to age groups was made. The interval between the two counts exceeded six months, and it was discovered that the population of this area had diminished by 56.

To account for this decrease was a matter of difficulty. It has been stated that portions of three sultanates conjoin in this triangle, and each chief sends in monthly figures of births and deaths for his sultanate as a whole, and not for the special portion of his chiefdom lying within the triangle. Immigration and emigration figures are collected for the whole district, not for any particular sultanate. This is an omission which has been corrected this year, and chiefs have been asked to specially mark in their registers all relative information with regard to the people in these areas.

To add to the difficulties, in these first attempts at a nominal roll it has been found that Natives may have two or more names, which they use alternately with or without intent to deceive—names given at birth, adopted later in life, or for special ceremonial occasions. To obviate this difficulty, the chiefs are being asked to ensure that names given at birth only be employed for census purposes.

For this reason, conclusions from the decrease in population in these areas are not at present practicable, but the information is tabulated below for comparison with later observations.

Twenty-eight children were born in this area in the year—eleven males and seventeen females—and one of each sex died. The birth-rate works out at 32·1.

In the absence of information as to age groups over 20 years, or of married and unmarried women of child-bearing years, the corrected birth-rate is roughly computed in relation to women over fifteen years of age at 81·1. The infantile mortality rate is 71·4. 326 huts stand in this area, making a distribution of 2·8 persons per hut. There are 58·1 persons and 21 huts to the square mile in the area.

ITARLUNGUTWE TRIANGLE, 1ST COUNT, MAY, 1928: TABLE 1.

Mtemi.	Male Adults.	Male Children from 2 to 14 years.	Male Children under 1 year.	Total.	Female Adults.	Female Children from 2 to 14 years.	Female Children under 1 year.	Total.
Mhanda ..	118	54	15	187	177	44	6	227
Nzilwa ..	59	29	3	91	80	22	6	108
Lumerezi ..	95	42	8	145	124	41	5	170
TOTAL ..	272	125	26	423	381	107	17	505

TABLE 2.—MALES.

Mtemi.	0-1 year.	2-5 years.	6-10 years.	11-15 years.	16-20 years.	20 and upwards.	Total.
Mhanda ..	1	22	15	23	7	93	161
Nzilwa ..	3	11	8	10	9	57	98
Lumerezi ..	7	12	16	20	4	65	124
	11	45	39	53	20	215	383

TABLE 3.—FEMALES.

Mtemi.	0-1 year.	2-5 years.	6-10 years.	11-15 years.	16-20 years.	20 and upwards.	Total.
Mhanda ..	8	20	14	20	5	150	217
Nzilwa ..	4	11	8	8	4	76	111
Lumerezi ..	5	17	13	16	9	101	161
	17	48	35	44	18	327	489

2. The second triangular area selected for a nominal roll of inhabitants was that between the roads joining Kahama, Ngaya and Mtobo—abbreviated for convenience and called the Kahangobo triangle. The area enclosed is roughly 140 square miles. Portions of four sultanates are included in it.

A diminution of 122 was noted in the totals of the two counts for the same reasons mentioned in connection with the first special census area.

The various rates were worked out on the same basis as above.

One hundred and sixty-seven births occurred—84 male and 83 female—in the area in the year, and 19 deaths under a year of age—9 male and 10 female.

The birth rate is 34.4 and corrected birth-rate 85.1.

The infantile mortality rate becomes 113.7. Of huts, 1,544 were counted. The number of occupants per hut is 3.2.

There are 34.6 persons and 11 huts per square mile in this area.

KAHANGOBO TRIANGLE. TABLE 1.

Mtemi.	Males.			Females.		
	Children from 2 to 14 years.	Children under 1 year.	Total.	Children from 2 to 14 years.	Children under 1 year.	Total
Kibela	798	33	831	1,054	38	1,092
Mhanda	104	12	116	148	1	149
Nzilwa	388	21	409	586	21	607
Mpiga	699	34	733	1,003	35	1,038
	1,989	100	2,089	2,791	95	2,886

TABLE 2.—MALES.

Mtemi.	0-1 year.	2-5 years.	6-10 years.	11-15 years.	16-20 years.	20 and upwards.	Total
Kibela	37	71	76	105	69	469	827
Mhanda	7	9	5	10	4	38	73
Nzilwa	25	55	55	52	39	229	455
Mpiga	50	78	84	93	47	376	728
	119	213	220	260	159	1,112	2,083

TABLE 3.—FEMALES.

Mtemi.	0-1 year.	2-5 years.	6-10 years.	11-15 years.	16-20 years.	20 and upwards.	Total.
Kibela	47	76	74	107	56	715	1,075
Mhanda	3	7	9	10	3	71	103
Nzilwa	29	58	42	44	26	412	611
Mpiga	46	86	93	78	36	642	981
	125	227	218	239	121	1,840	2,770

3. At Ungoni, a self-contained sultanate, little difficulty was anticipated in getting figures to agree closely. The differences observed are due most probably to the errors of the counters in the general census, which was done, it will be remembered, by the Natives themselves. The figures of the general and special census are given for comparison. They indicate the probable error in computation for all sultanates.

GENERAL CENSUS RESULT.—UNGONI (APRIL, 1928).

All Males over 1 year	..	..	..	..	..	..	339
All Females over 1 year	..	..	..	..	..	..	486
Males under 1 year	..	..	..	..	..	..	96
Females under 1 year	..	..	..	..	..	..	102
TOTAL	..	..	..	..	..	..	1,023

The total of births in 1928 in this sultanate were 49, of which 25 were boys and 24 girls. The number of deaths under a year of age were 6 boys and 5 girls—11. No still-

births were reported. Deaths over a year of age totalled 31—12 males and 19 females. The number of immigrants and emigrants is not recorded separately.

1ST NOMINAL ROLL (JULY, 1928).

Males over 1 year	..	..	..	..	..	..	..	470
Females over 1 year	..	..	..	..	..	..	..	702
Males under 1 year	..	..	..	..	..	..	..	16
Females under 1 year	..	..	..	..	..	..	..	24
Total	..	..	..	..	..	..	..	1,212

2ND NOMINAL ROLL (NOVEMBER, 1928).

Males	..	..	..	..	..	..	..	506
Females	..	..	..	..	..	..	..	751
Total	..	..	..	..	..	..	..	1,257

Subtracting the number of deaths over and under a year from the total births, the increase in the year is 7 souls, which brings the total population to 1,030 on the General Census. The greatest difference between the three counts is 234, and this is an increase, and unlike the previous areas' figures which showed a reduction. The number of immigrants into Ungoni is, in any case, not nearly equal to this figure, as the total of immigrants in to the whole district did not exceed 209. It is possible that many absent from the sultanate but still in the district, returned after or hid during the census and withheld their names. It is also possible that the husbands or wives in case of intermarriage were not held to be true Wangoni and were excluded from the totals. It is also more than likely that the first was a miscount from inefficiency and carelessness. The error is not, however, considered to be as high as 22·8 per cent. on carelessness alone. The other factors probably also enter into it, to a greater or less extent.

Succeeding census will tend to be more accurate, if only from practice, and will show by comparison the magnitude of error in these, the first actual counts.

The following rates have been worked out for this sultanate.

								Per mille.
Death rate	..	..	..	..	..	..	..	41·0
Birth rate	..	..	..	..	..	..	..	47·8
Corrected birth rate	..	..	..	..	..	..	..	91·0
Infant mortality rate	..	..	..	..	..	..	..	224·6

The birth rate ratio is 116.

There are 10·2 persons and 5 huts per square mile.

District.—On the figures available for the district as a whole, the crude death rate is seen to be 24·8 per mille. The specific death rate for males and females is 30·1 and 23·0 per mille respectively. The birth rate is 28·0 per thousand. The infantile mortality rate is 293·8 per mille.

The morbidity rate, based on the numbers of patients attending our centres, is 304·2 per thousand. In actuality it is higher.

The vital index stands at 102—the margin being an extremely narrow one on the side of safety.

With a view to obtaining a general idea of the number of children born to a Native woman, the number that survive, the causes of death among children, the ages at which death overtook them—in brief, the life-history of the Native woman during the period of sexual activity, enquiries have been made among women from eighteen to sixty-five years of age and records kept at each of our clinics and welfare centres. Over a thousand such histories have been obtained in tabular form.

Observations on these lines at the Uyogo Welfare Centre are taken as being the most complete and as typical of the district.

Four hundred and fifty women were questioned and histories taken. The average age of these women was 39·8 years. The average number of times that they were married (legally) is once per person, though many admit marriages of convenience on two and three occasions in their life-time. Marriage is, however, a loose contract with them.

The average period of legal married life works out at 13·7 years. The number of children born to each person is 2·5, represented by a range between no children and twelve. Eighty-three of those questioned were childless, and many of these give a history of venereal disease or yaws. A percentage of 18·6 were barren. Abortions and miscarriages equal 0·37 per woman, or 37 per cent.

The number of children living and the number dead (inclusive of abortions and miscarriages) per woman was 1·3 and 1·2 respectively. Exclusive of abortions, etc., 30·8 per cent. died within a year and 24·2 per cent. before ten years of age.

The causes of death in order of importance are stomach and bowel complaints, fevers, pneumonia, congenital syphilis, inflammations involving limbs, infantile convulsions and smallpox. Forty-eight per cent. of the mothers gave a history of venereal disease or yaws.

KAHAMA DISTRICT, 1928.—IMMIGRANTS.

[illegible]

EMIGRANTS.

[illegible]

SUMMARY.

APPROXIMATE AREAS, COMPARISON OF POPULATIONS AND BIRTHS AND DEATHS.

No	Sultanate.	Approximate area in square miles.	Estimated population, 1926.	Census, 1928.	Apparent increase or decrease.	1926.				1928.							
						Births.		Deaths under 1 year.		Deaths over 1 year.		Births.		Deaths under 1 year.		Deaths over 1 year.	
						M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
D. 1	Kahama and Township ..	500	20,200	22,893	2,693	300	274	59	67	110	136	359	352	113	80	110	122
D. 2	Usumbwa ..	3,000	17,000	18,833	1,833	132	75	51	45	97	83	104	110	55	54	129	97
D. 3	Ngogwa ...	800	7,300	7,144	—156	126	100	52	36	68	60	116	127	32	36	96	108
D. 4	Ukamba ..	500	3,800	3,688	—112	62	58	20	18	23	42	79	75	11	18	32	48
D. 5	Mbogwe ..	500	5,100	5,719	619	107	66	16	19	35	42	58	70	5	2	75	53
D. 6	Uyogo ..	350	7,300	7,299	—1	95	104	26	29	39	44	159	150	56	45	64	81
D. 7	Msalala ..	350	3,600	3,182	—418	45	59	13	18	16	20	61	50	24	16	28	28
D. 8	Busangi ..	350	5,300	5,129	—171	67	58	19	22	29	41	104	108	42	23	41	47
D. 9	Bulungwa ..	200	4,200	4,040	—160	34	31	10	14	21	18	47	48	15	9	47	38
D. 10	Ungoni ..	100	1,000	1,023	23	15	15	6	12	15	18	25	24	6	5	12	19
D. 11	Bugomba ..	500	1,100	1,084	—16	22	10	8	4	19	14	12	5	10	2	32	21
	TOTAL ..	7,150	75,900	80,034	4,134	1,005	850	280	284	472	518	1,124	1,119	369	290	666	662

PATIENTS.

The total number of patients admitted to all the hospitals in the district, exclusive of the ones devoted to sleeping sickness, was 1,567. One hundred and forty-five deaths occurred among in-patients, a percentage of 9·2.

Twenty-two thousand nine hundred and six people sought assistance as out-patients. Of these, 10,937 were men, 10,612 women, and 1,357 children.

The total of patients admitted and attending for treatment exceeds 24,000 in the year.

Yaws and syphilis continue to be the predominating diseases, accounting for 9,590 cases—7,225 of the former and 2,365 of the latter.

Pulmonary diseases as a group come next in order of importance with a total of 2,595, followed by ankylostomiasis, with 1,350.

Towards the middle of the year a few cases of smallpox were reported from the northern area, the original contact being traced to a district of the neighbouring province of Mwanza. Immediate prophylactic measures circumscribed the focus and prevented a formidable epidemic. Infectivity in diseases such as this is a conception that the Native is dimly aware of, but his duty to his neighbour is not strongly developed, and segregation is a principle difficult to put into execution in the bush.

Sporadic cases of chicken-pox and measles have been reported from all quarters. Pulmonary tuberculosis is fortunately rare.

An occasional case of leprosy is encountered in the district. The Leper Asylum for the district is situated at Ushirombo and was formerly the responsibility of the mission.

The number of patients in the settlement during 1928 was 25. Five deaths occurred, and with desertions and admissions the total remaining at the end of the year was 16.

Insect-borne diseases are not uncommon, malaria and relapsing fever are frequently diagnosed in children, and the parasites are seen in the blood of adults debilitated from other causes. The Natives recover from either of these diseases without treatment, and it is often only when the attack is unusually severe that they solicit assistance.

Microfilaria perstans and *bancrofti* are sometimes seen in the examination of blood films.

In January, 1928, a case of trypanosomiasis was discovered in the heart of the district, and grave fears, since confirmed, of an epidemic, were entertained. Conditions are ideal for the rapid spread of the disease.

The origin of the epidemic is uncertain, but it is believed to have commenced about a year earlier in the villages of the remote west of the district. Introduced possibly by the passage through the area of an infective traveller, a new or relapsed case, or the return of a wanderer to his home from the southern provinces, where the disease has been endemic for some years, its dissemination has been assisted, after the decimation of a village or two, by the dispersal of the survivors. Cases are now coming in from the north, west, south and centre of the district.

There have been 948 cases of the disease treated in the district in the year and 136 deaths, including Ushirombo Sleeping Sickness Hospital figures. These numbers do not represent the total of victims, for many have never sought treatment, and died in their homes or in the bush. The incidence is 1·1 per cent. on the total population.

Several cases of schistosomiasis (*Schistosomum hæmatobium*) were discovered among the school children at Zongomera.

Jiggers are commonly found all over the district, but the Natives remove them themselves.

With these general remarks on the diseases of the district as a whole, we pass to a consideration of the work for the year of each clinic, welfare centre and hospital contributing to the alleviation and cure of the maladies of the inhabitants.

Kahama Clinic.

This clinic was the first to be established in the district, and has had its doors open to women and children for two years. For the first quarter, Nursing Sister Miss A. L. Ryder conducted its working. Nursing Sister and Health Visitor Miss B. G. Allardes has been in charge of it since.

With the aid of the motor ambulance, however, visits have been made by the sister to villages further from the clinic than has hitherto been possible, and such visits have been arranged on days when the number of attendances has been small.

Admissions—		1927.	1928.
Women		209	204
Children		155	99
Ante-natal examinations		40	130
Confinements in clinic		10	21
Examined or treated—			
Women		2,163	2,371
Children		1,476	1,899
Attendances—			
Women		5,483	6,989
Children		5,949	7,630
Visits paid by sister in township and district ..		1,372	726

From a comparison of these figures, it will be observed that the general totals show a diminution in the number of admissions and an increase in the number of out-patients and attendances.

The differences are, however, not great. The Native still consider the clinic a general hospital for women and children, but it is gratifying to note that the admissions for confinements and the number of ante-natal examinations have doubled in the one case and greatly increased in the other. This holds out hope for the future.

Among the twenty-one cases of confinements and those admitted in the pre- or post-natal state, two have had retained placenta, one was a case of placenta prævia with prolapse of cord, one an abortion, five threatened abortions, two premature births, two cases of prolapsed uterus, and one of albuminuria of pregnancy. Two cases of puerperal sepsis were also admitted.

It has been noticed among women confined in the clinic that several have a slight febrile reaction shortly after parturition lasting for twelve to twenty-four hours. Malaria parasites have often been demonstrated in the blood at such times, though no febrile symptoms were manifest at an earlier stage, and no parasites were discoverable. Sepsis in all such cases was carefully excluded. It has been looked upon as a reactionary effluxion of a dormant malarial infection.

The number of instances among new-born children in which supernumerary digits have been seen merits mention. Twelve were attended to.

Kahama Native General Hospital.

A new hospital was erected during the year for the Native general population, in substitution for the old series of mud and wattle huts which did service previously. With the limitations of space in both the clinic and new hospital and the influx of sleeping sickness cases, the old hospital buildings have again had to be brought into use.

During the year 2,235 out-patients were treated, including 2,159 men and 76 women, and 299 were admitted into hospital. Deaths numbered 25.

A few operations for hydrocele, elephantiasis scrotum and removal of tumours were done by way of advertisement to the clinics and hospitals from time to time.

The Native is more impressed by the removal under anæsthetic of a tumour the size of a melon, than a more intricate abdominal operation which leaves nothing but a two- or three-inch scar. Results are more evident in the former, and he is ignorant of the danger and special skill required for the latter.

Nine men were admitted for injuries inflicted by lion and leopard. Three were so mauled that they succumbed to their injuries. All wounds of this type become rapidly septic.

Runzewe Clinic.

This clinic is in the middle of the bush in the Western Area, and has been in charge of Senior Nursing Sister and Health Visitor Miss E. L. Kemsley till August, when she proceeded on leave and was succeeded by Drs. C. and (Mrs.) F. G. Wilcocks.

Fresh food and water are scarce, and the clinic is hemmed in by bush. Tsetse fly are numerous in wet weather, and a walk for exercise by day is unpleasant because of their attentions, and at night it is hazardous by reason of the presence of wild animals. These are indeed encountered at times in the day. White ants abound, and are destructive of most materials other than metal or glass. In the rains, insects of a thousand shapes, sizes and colours invade the houses, and reptiles have been killed on the premises.

With the eastward advance of the wave of sleeping sickness, Runzewe has been enveloped, and it has been deemed prudent to remove the entire population to a settlement near Ushirombo. This clinic will therefore have to close its doors and reopen in a more suitable locality. Two of the Native staff of the clinic contracted sleeping sickness.

Visits by the Sister and Medical Officers totalled 920.

Two hundred and twenty-five patients were admitted to the clinic in 1928, of whom 58 were children. Two confinements and 11 ante-natal examinations were conducted. There were 25 deaths in the year.

One thousand two hundred and eighty-nine women and 783 children contributed to a total of attendances of 3,698, while 3,279 were treated in the district. It is to be noted that in this clinic the figures for out-patients represent the nature of cases rather than the actual number of patients. A deduction of about 5 per cent. from this total approaches the actual number of out-patients.

The Native Authority Hospital has been supervised by the Sister and Medical Officers of the clinic, and has admitted 197 and treated 696 cases.

Uyogo Welfare Centre.

This centre for three of the southern sultanates has been the charge of Sub-Assistant Surgeon N. C. Daniel. This hospital is also hemmed in by bush, and food and water are difficult to obtain. Both sexes and all ages are treated at the welfare centre. There have been 140 admissions and 12 deaths, while 4,069 patients in the centre and district have been administered to, as out-patients. Patients have included some from the neighbouring districts which adjoin the southern sultanates. Mr. Daniel, in his tours of the district, has shown initiative and resource, and has collected interesting and valuable information on the customs of the Natives, much of which has been corroborated and confirms investigations in other parts of the district. Most of his observations are incorporated in the chapter on the subject to follow.

Itaranganya Welfare Centre.

Sub-Assistant Surgeon Jagat Singh has had control of this hospital which serves the four northern sultanates. Here, too, a few people of the neighbouring district of Shinyanga and the province of Mwanza have been treated.

One hundred and four admissions have been made and seven deaths have taken place.

As out-patients at the clinic and in the district, there have been treated 5,129—of these 2,676 were men and 2,453 women.

Sixty-five new births, five cases of abortion and fifteen of retained placenta, were visited in the district.

At the Native Authority Hospital, Ushirombo, 295 patients were admitted and 1,637 treated—753 women and 884 men.

At the Sleeping Sickness Camp at Masumbwe, 906 cases other than trypanosomiasis received attention.

Totals of admissions and out-patients for each clinic, welfare centre and hospital, are embodied in the table on page 121.

A table has also been prepared showing the diseases most prevalent in the district and their number.

It has been the policy to allow each clinic, welfare centre and hospital, to be independent and self-reliant. Opportunities for consultation and surgical assistance have been afforded by frequent visits to all.

The relation of climatic and other influences to disease is as marked in certain directions as would be expected, and obscure in others. Definite observations on these in reference to local conditions can only be made after closer study over a longer period.

Pulmonary diseases are more in evidence in the wet months, which are also more continuously cold. How far the range and mean and the humidity affect pulmonary conditions has not as yet been studied closely.

It has been noticed that relapsing fever is most prevalent, both among the younger Natives and more especially the foreign population when the rainfall is heaviest. Whether a rise in the ground water, apart from the natural stimulus for food, drives the tick to the surface or whether conditions of temperature and humidity favour the hatching of new infective broods, unfed and avid, is still a moot point.

Tsetse flies and mosquitoes are more numerous in the rainy season, causing a rise in the curve for sleeping sickness and malaria.

House flies and calliphora, while present all the year around, increase greatly in numbers after the rains and before the hot weather is at its height. There is not, as would be thought, much infantile diarrhoea from this cause, as Native children are mainly breast fed from ten days or so after birth. Intestinal irritation among them is caused by the ingestion of gruel at an early age, and this is not confined to any season. Purulent conjunctivitis is not uncommon at this season among children and adults. A non-purulent conjunctivitis and laryngitis quickly responding to treatment are met shortly after harvest time, among women and children specially. Its origin was at first puzzling, but it was later discovered that it is the work of the women to thresh and sift grain. This work is performed on a cleared space outside a village, where several women foregather with their infants on their backs and the older children playing around. High winds are frequent at this time of year, and assist the sifting process. Dust and husk have been found to be responsible for these causes.

No marked increase of primary yaws has been noticed in the fly season.

The drying and stagnation of weed-filled pools before the monsoon is responsible for an increased seasonal incidence of diarrhoea. The Natives in this part permit their cattle to wade into and drink water at the same pool from which their own supplies are drawn. High as their acquired resistance must be to bacterial invasion of the alimentary canal, it is sometimes insufficient to withstand this continued gross pollution of their water supply.

Venereal diseases and yaws maintain a consistently high level of incidence. Our work is in its infancy, and it is too early to note the effect of years of famine and prosperity on these diseases. The customs and morals of the Natives conduce to and are responsible for the continued spread of venereal disease.

VACCINATION.

Protection from smallpox in the form of vaccination has been offered to the people of the district on a larger scale than heretofore.

There are many who are afraid and abscond on the arrival of the vaccinator. On the other hand, certain sub-tribes are aware of and have practised, from all accounts, direct inoculation from the pustules of a patient.

The greater number of persons vaccinated in the year have been children. Many of the adults have already been protected in recent years.

It is mentioned as a point of interest, that vaccination on the deeply pigmented skin of the African frequently produces a keloid protuberance.

Sub-assistant surgeons, Native dispensers and sanitary inspectors have been entrusted with this work, and results have from time to time been checked.

Twelve thousand three hundred and sixty people have been vaccinated ; 5,731 successfully ; 3,579 did not " take," and 2,960 failed to appear for reinspection.

Details are contained in the following table :—

VACCINATION RETURN, 1928. KAHAMA DISTRICT.

—	Successful.	Negative.	Not seen again.	Total.
KAHAMA—				
Native dispenser	1,817	588	211	2,616
African district sanitary inspector ..	819	631	316	1,766
UYOGO—				
Sub-assistant surgeon	363	185	21	569
Native dispenser	578	410	184	1,172
RUNZEWE—				
S.A.S. and Native dispenser	96	103	634	833
ITARANGANYA—				
Native dispenser	1,455	813	832	3,100
USHIROMBO—				
A.D.S.I.	603	523	707	1,833
MASUMBWE—				
Sub-assistant surgeon	90	326	55	471
TOTAL	5,821	3,579	2,960	12,360

IN-PATIENTS, 1928. TOTALS OF CLINICS, WELFARE CENTRES AND AUXILIARY HOSPITALS IN KAHAMA DISTRICT.

—	Remaining.	Admitted.	Died.	Total treated.
Kahama Clinic	4	303	32	307
Kahama Hospital	9	290	25	299
Runzewe Clinic	—	225	25	225
Runzewe Hospital	16	181	6	197
Itaranganya Welfare Centre	—	104	7	104
Uyogo Welfare Centre	—	140	12	140
Ushirombo (native dispenser)	—	295	38	295
TOTAL	29	1,538	145	1,567

OUT-PATIENTS.

—	Males.	Females.	Children.	Total
Kahama Clinic	—	2,006	1,357	3,363
Kahama Sultanate	365	281	—	646
Kahama Hospital	2,159	76	—	2,235
Runzewe Clinic	167	779	—	946
Runzewe District	1,421	1,858	—	3,279
Runzewe Hospital	693	3	—	696
Itaranganya Clinic and District	2,676	2,453	—	5,129
Uyogo Clinic and District	2,185	1,884	—	4,069
Masumbwe	518	388	—	906
Ushirombo	753	884	—	1,637
TOTAL	10,937	10,612	1,357	22,906

PREVAILING DISEASES, 1928.

					In- patients.	Out- patients.	Total.
KAHAMA CLINIC—							
Yaws	..	..	..	..	10	641	651
Syphilis	..	..	..	..	13	479	492
Pulmonary diseases	..	..	..	..	20	463	483
Ankylostomiasis	..	..	..	..	39	134	173
Trypanosomiasis	..	..	..	..	60	—	60
Total	..	..	..	..	142	1,717	1,859
KAHAMA HOSPITAL—							
Yaws	..	..	..	..	14	665	679
Syphilis	..	..	..	..	38	231	269
Pulmonary diseases	..	..	..	..	13	483	496
Ankylostomiasis	..	..	..	..	11	87	98
Trypanosomiasis	..	..	..	..	67	10	77
Total	..	..	..	..	143	1,476	1,619
ITARANGANYA WELFARE CENTRE—							
Yaws	..	..	..	..	7	2,359	2,366
Syphilis	..	..	..	..	4	838	842
Pulmonary diseases	..	..	..	..	6	331	337
Ankylostomiasis	..	..	..	..	7	20	27
Trypanosomiasis	..	..	..	..	27	7	34
Total	..	..	..	..	51	3,555	3,606
UYOGO WELFARE CENTRE—							
Yaws	..	..	..	..	24	344	368
Syphilis	..	..	..	..	18	323	341
Pulmonary diseases	..	..	..	..	10	589	599
Ankylostomiasis	..	..	..	..	10	6	16
Trypanosomiasis	..	..	..	..	27	—	27
Total	..	..	..	..	89	1,262	1,351
RUNZEWE CLINIC—							
Yaws	..	..	..	..	93	334	427
Syphilis	..	..	..	..	29	86	115
Pulmonary diseases	..	..	..	..	14	125	139
Ankylostomiasis	..	..	..	..	11	123	134
Trypanosomiasis	..	..	..	..	49	11	60
Total	..	..	..	..	196	679	875
RUNZEWE HOSPITAL—							
Yaws	..	..	..	..	100	1,654	1,754
Syphilis	..	..	..	..	5	162	167
Pulmonary diseases	..	..	..	..	6	317	323
Ankylostomiasis	..	..	..	..	7	764	771
Trypanosomiasis	..	..	..	..	49	41	90
Total	..	..	..	..	167	2,938	3,105
MASUMBWE (Sleeping Sickness Measures)—							
Yaws	..	..	..	..	—	137	137
Syphilis	..	..	..	..	—	30	30
Pulmonary diseases	..	..	..	..	—	53	53
Ankylostomiasis	..	..	..	..	—	32	32
Trypanosomiasis	..	..	..	..	—	327	327
Total	..	..	..	..	—	579	579

PREVAILING DISEASES, 1928—*continued*.

					In- patients.	Out- patients.	Total.
USHIROMBO (Native Dispenser)—							
Yaws	..	..	..	..	84	759	843
Syphilis	..	..	..	..	10	99	109
Pulmonary diseases	..	..	..	..	3	162	165
Ankylostomiasis	..	..	..	..	17	82	99
Trypanosomiasis	..	..	..	..	129	25	154
Total	..	..	..	..	243	1,127	1,370
TOTAL OF ALL CLINICS, ETC.—							
Yaws	..	..	..	..	332	6,893	7,225
Syphilis	..	..	..	..	117	2,248	2,365
Pulmonary diseases	..	..	..	..	72	2,523	2,595
Ankylostomiasis	..	..	..	..	102	1,248	1,350
Trypanosomiasis	..	..	..	..	408	421	829
TOTAL	..	..	..	..	1,031	13,333	14,364

A few disconnected observations of interest made on pregnant women at the Kahama Clinic are here noted.

Measurements of the height of the fundus are little help in diagnosing the stage of pregnancy in many cases. This is thought to be due to the great dilatation of the stomach so frequently met; and after a meal, palpation of the fundus in the seventh month and onwards is a matter of uncertainty. Enlarged spleens and livers increase the difficulty.

The os externum of the cervix has frequently been noted to be patent as early in pregnancy as the end of the fifth month among multiparæ. The os has also been noted to be dilated to the diameter of half a crown and more, with membranes presenting, and the patient has been unaware that labour had commenced. It would appear in many cases that the pains of travail are first felt when the os has dilated to a diameter of 2 inches or more. As pain is subjective it is difficult to gauge its intensity, but from the behaviour of the African woman in labour, it can be stated that the pains, while severe, are a few degrees less than those experienced by the western mother, for there is no reason to suppose that the former controls her feelings any more, nor is there necessity for it. Labour is certainly not, as may be thought from their closeness to nature, a painless process with the Native.

The Native woman does not "use" her pains when necessary, but prefers to sit inert. This possibly explains the frequency with which prolapse of the cord is met.

After confinement, she is induced with difficulty to lie down and rest, but sits bolt upright on the edge of her bed with her feet on the ground. No satisfactory explanation for this attitude has been vouchsafed.

The amount of hæmorrhage following the delivery of the placenta has been remarked as being surprisingly small.

The African mother will get up from her bed within a quarter of an hour of the birth of her child if not watched, and wander round the premises, without apparent ill effect.

She will often leave her hungry squalling infant on the bed, while she saunters off to converse with friends for an hour or more. A patient seriously ill or thought to be dying is deserted.

Contradictory as it may sound, in view of the preceding paragraph, it is considered brutality to deny a child anything it may want from milk to beer. It is equally brutal to force on a child anything it may not want, whatever the intention. We have had mothers saying that medicine taken home for a child has not been given, as the child did not like it, and others have been anxious to take their children out of the clinic before they were well, for the same reason.

Curiously enough, when a child is able to express itself collectedly—usually from 5 to 6 years of age—while its food is still provided, it otherwise fends for itself and is neglected.

Many patients on admission are found to have more diseases than one. For statistical purposes, the most acute or important of those recorded, is the one taken into account. For this reason, figures for such diseases as yaws, syphilis, ankylostomiasis, are an underestimate of actual incidence.

The Native continues to consider the clinics as institutes for the aged and decrepit. Many continue with their own medicine till they are practically moribund, when admission is sought. Many could be cured by early treatment, who are crippled through delay.

SCHOOLS.

In the early part of the year there were two Native schools in the township—one for Arab children exclusively and the other a Kindergarten—for Native children. Fourteen boys, ranging from 5 to 14 years of age, attend the Arab school, which has been visited by the Health Visitor at intervals. The Kindergarten, situated next to the clinic, accommodated about 40 children of both sexes, up to the age of 12 years. This was also the medical responsibility of the Health Visitor. This school was closed in the middle of the year.

A new one, admitting the sons and a few of the daughters, the latter as day scholars, of headmen of the district, was opened at Zongomera, $4\frac{1}{2}$ miles from the township, by the Native Authority, at the instigation and with the approval and support of the Administrative and Education Authorities.

About 90, ranging in years from 6 to 16, are on the school rolls, and over 60 of these are boy "boarders."

On the reopening of school in October, all the children were examined and their school cards filled. It is proposed to re-examine the children periodically and compile statistics relative to weights, height, etc. Ages have to be gauged and confirmed by enquiry.

Medical aid is rendered at the local clinic. A hundred and fifty children attending on 857 occasions were treated. These figures are included in the general totals of the local clinic. Ankylostomiasis, conjunctivitis and skin diseases were the bulk of conditions treated. Thirty-seven boys were treated for schistosomiasis; enquiries are being extended into their villages as to the prevalence of the disease.

Most cases have been treated with intravenous injections of antimony tartrate, and symptoms have been ameliorated. Three definite relapses have received further treatment with the same drug, with apparent benefit.

A proposal to carry out dietetic experiments well within the margin of safety among selected school children with a view to ascertaining from results over short periods the nutritional value of certain combinations of foods locally procurable, was abandoned, as the local Administration were of opinion that the time was not ripe for such an experiment. The school has been in existence only a few months and the Natives would possibly misinterpret the object of the investigation.

A motor ambulance for work in the district arrived in October. It covered 2,359 miles, and took 120 patients to our clinics and welfare centres.

On several occasions the ambulance was sent out on receipt of information to bring in patients and returned empty, as those for whom it was sent, refused to travel in it. On other occasions people have considered it has been provided to give them a "lift" into Kahama from the district. Others with the same object but more guile, have sent in reports of people so seriously ill as to be unable to stand the journey in a "machela" (hammock), and on arrival the "patients" have skipped gaily out of the car, with nothing more serious than a headache or a "cold." The ambulance has become more popular

latterly and people who, before its arrival would not have bothered to seek advice, or who would have walked 50 miles for it, now send in urgent messages for the car and this, whether the distance be a mile or 50 miles. It is difficult to check this form of abuse.

The roads, too, cannot stand much heavy traffic and become badly rutted. A heavy car is unsuited to the roads in this district, and bridges frequently sink or collapse under it. In dry weather, our ambulance has frequently been in difficulties in sand patches, and damage to springs and other parts of the car has been sustained through ruts, stones, holes and other hazards partially hidden by undergrowth on the roadways. In wet weather, the car has frequently sunk to the axles or slid into the ditches at the side of the road. For three or four days after rain, we dare not send the ambulance out. Experience has shown that it rarely reaches its destination without accident. Fortunately, no patients have been involved in these mishaps.

A couple of lighter cars, caged in with gauze for protection from tsetse flies, are expected next dry season.

SPECIAL.

Experiments were made with a plant reputed to be a galactagogue. Only three suitable cases were available, but in these, the claims for the plant appear to have been substantiated. More data will require to be collected before definite information can be gleaned.

A few specimens of mosquitoes, tsetse flies and other insects have been collected and will be forwarded for identification to the entomologist when a representative collection has been made.

Ornithodoros moubata is common all over the district. Eighteen per cent. of a series of 60 collected from rest camps and Native huts in the district were found to be infective.

Cercaria of *Schistosomum hæmatobium* were found in seven of eleven snails collected from a pool in the southern area.

Pediculi corpora and *Cimex lectularius* are common on the persons and in the homes of the natives of the larger villages.

Tunga penetrans can be picked up in any house where the workmen have recently been busy.

Tabanid flies are met near swamps and *Stomoxys calcitrans* in the vicinity of most villages where cattle are kept. *Cordylobia anthropophaga* have been found.

Close on a 1,000 slides have been examined for ova and parasites. Two hundred and eighty-seven have been seen at Runzewe and the remainder for the whole district in Kahama. Seven hundred and thirty-three were examined for the two clinics. The following were reported on: *Trypanosoma rhodesiense*, parasites of subtertian malaria, *Spirilla duttoni*, *Microfilaria bancrofti* and *perstans*, ova of *Necator americana*, and *Schistosomum hæmatobium*, *B. lepra* and tuberculosis, and gonococci.

PROPAGANDA.

At many of the gatherings of the chiefs and at the principal villages in the district, the Administrative Officers have explained the aim of the Government in providing local clinics and welfare centres and advised the inhabitants to take full advantage of the provision made.

Visits by the Secretary for Native Affairs and the Provincial Commissioners have been utilised to further these ends.

On every visit of the medical staff seniors and subordinates to the larger villages and the bush, the Natives are invited and encouraged to seek advice for any ailment. The contents of a pamphlet of instructions on sanitation and hygiene are explained, and short talks on the prevention of disease given. The necessity of seeking advice and treatment early has been explained.

All the chiefs have been conducted over the Kahama Clinic and shown its working.

A lantern lecture was delivered to a large gathering of Natives with a view to ascertaining whether pictures would appeal and how long the interest of the African peasant could be maintained. The response was sufficiently encouraging to warrant the purchase of a portable lantern with a series of slides for propaganda purposes.

Through the Editor of "Mambo Leo," a series of health slogans and a serial story on the life-history of the house fly in simple language were published, as much for general as local interest and instruction.

All available means of propaganda, suitable to the environment and mentality of the people are being utilised.

A Baby Show was held during the year at each of our clinics and welfare centres. Advertised and organised through the Administration, the attendances were very encouraging and prizes were given. A few notes were made at the parades and are appended.

Kahama Baby Show, held on January 1, 1928.

Total attendance (men, women and children), about	..	..	2,000
Mothers .. .. .	..	..	980
Children—			
Male .. .. .	..	..	523
Female .. .. .	..	..	497
			<hr/>
			1,020
Children disqualified	..	..	918
		Snuffles.	Sore Eyes.
Male .. .. .	..	..	185
Female .. .. .	..	..	204
			53
			66
			<hr/>
			212
			198
			<hr/>
Total .. .. .	..	..	389
			119
			410

It is to be noted that on this occasion children up to 4 and 5 years—about 100 of them—were permitted as entrants.

Ninety per cent. were disqualified on a cursory examination, consideration being given also to anæmia, poor condition and dirt. Ventral and umbilical hernia showed a percentage of forty-four point six (44.6).

Ushirombo Baby Show, held on October 4, 1928.

Total attendances (approximately)	..	..	700
Mothers .. .. .	..	..	230
Children—			
Male .. .. .	..	..	119
Female .. .. .	..	..	111
			<hr/>
			230
Children disqualified	..	..	211
		Snuffles.	Sore Eyes.
Male .. .. .	..	..	27
Female .. .. .	..	..	34
			26
			30
			<hr/>
			52
			42
			<hr/>
Total .. .. .	..	..	61
			56
			94

Ninety-two per cent. disqualified, 44.5 per cent. for hernia.

Uyogo Baby Show, held on October 8, 1928.

Total attendance (roughly)	..	..	700
Mothers .. .. .	..	..	365
Children—			
Male .. .. .	..	..	208
Female .. .. .	..	..	173
			<hr/>
			381
Children disqualified	..	..	293
		Snuffles.	Sore Eyes.
Male .. .. .	..	..	8
Female .. .. .	..	..	4
			10
			13
			<hr/>
			125
			133
			<hr/>
Total .. .. .	..	..	12
			23
			258

Seventy-six point nine disqualified: 88.0 per cent. for hernia.

Itaranganya Baby Show, held on October 11, 1928.

Total attendances (about)	..	..	..	..	..	..	800
Mothers ..	..	..	..	..	..	..	420
Children—							
Male	..	..	..	..	..	230	
Female	..	..	..	..	..	222	
						<hr/>	452
Children disqualified	..	..	..	..	..	..	310
				Snuffles.	Sore Eyes.	Vent. and Umb. hernia.	
Male	..	..	..	10	2	142	
Female	..	..	..	6	1	149	
				<hr/>	<hr/>	<hr/>	
Total	..	..	..	16	3	291	

Children disqualified for disease totalled 68·5 per cent., of which 93·8 per cent. were hernia.

Reviewing the observations of all these shows, over 83 per cent. were ruled out on various counts and 55 per cent. of those disqualified were ventral or umbilical hernia.

Expressed as a proportion of the total children present, the percentage of ventral and umbilical hernia was 45·7.

Sister B. G. Allardes judged entrants at these Baby Shows.

Meteorological instruments were received on loan through the courtesy of the Agricultural Department for two of our clinics till our own arrived. As soon as these were installed, the personnel were trained to take readings and record them.

Records of maximum and minimum shade temperatures, wet and dry bulb readings and rainfall for several months of the year in four quarters of the district are now available and results are summarised in the tables.

TRIBES AND THEIR SUBDIVISIONS RESIDENT IN KAHAMA DISTRICT.

Tribe.	Sub-Tribe.	Locality.	Reported to have come from—
WANYAMWEZI	Wakamba	Kahama Ukamba	Kondoa-Irangi.
	Waloha	Ngogwa Busangi Ntobo	(Mwingilo) Mwanza.
	Wazondwe	Msalala	
	Walungwa	Masumbwe Bulunga Mpunze	Namanyere (Ufipa).
	Wayogo	Uyogo Ukuni	Kilimatinde (Dodoma).
WASUMBWA	Wagomba	Bugomba	Uha (Kisaka Bukoba).
	Washirombo	Ushirombo	Bukanga (Bukoba).
	Walangwa	Ulangwa	
	Watambala	Utambala	
	Wasonge	Usonge	Mwanza.
	Wanzebe	Runzewe	
	Wayovu	Uyovu	
	Walebe	Ulewe	Bukoba and Mwanza.
WAZINZA	Wazinzu	Mbogwe	
MATUSI			
WANGONI	—	Ungoni	Songea.

ETHNOLOGY.

Eighty thousand people live in the district. There are two main tribes, the Wanyamwezi and Wasumbwa. The former predominate and occupy the eastern two-thirds of the district.

Among both there are sub-tribes taking names from their place of settlement or from the original tribe from which they claim descent. In earlier days they came in with invaders and, with the cessation of strife, settled from choice or necessity. Some of these are stated to have been conquerors, others hostages and prisoners.

A list of the main tribes and divisions, with as far as possible the source from which they emanated, is contained in a table on page 127.

The Watusi are a wandering tribe, whose main occupation is cattle breeding. Their tribe settles temporarily where grazing is good and wander farther afield when it ceases to be so. They know no boundaries, but conform to the rules of the sultanate in which they are temporarily resident. This temporary residence may be extended from a few weeks to several years and is dependent on the presence of fodder for their cattle.

The population is unevenly distributed. Vast tracts of forest are uninhabited, and the higher slopes of the hills are usually eschewed.

The nature of the soil, the proximity of water, the relative paucity of carnivora, game and tsetse fly and the character of the chief, are the principal considerations influencing the choice of a site for settlement. The last mentioned was a prime consideration in earlier days when the chiefs were autocratic rulers, and the aim then was to put as great a distance between himself and the chief as possible. The innermost depths of the forest answered the purpose and was one cause for the origination of the bush village.

Dwelling-places.

The Natives build themselves two main types of hut, both of a circular shape.

Forked poles (nguzo) about 8 feet in length, are arranged on the circumference of a circle of a diameter of 10 to 12 feet. These are sunk to a depth of $1\frac{1}{2}$ to 2 feet in the ground and are placed about a foot apart with space for a door. The intervening spaces are occupied with other poles about 3 inches thick, but not forked. To give security to this wall, long slender withes are bound inside and out in three or four horizontal circles with an intervening space of about 2 feet. These are secured with strips of bark, $\frac{1}{2}$ inch wide, from the "miombo" tree. Twelve hours' immersion in water renders the bark pliable and easily cut in strips. The strips are then used like tape.

With the skeleton walls up, a scaffolding is erected on the forked ends, to assist in the construction of the roof. Four long tapering poles (selele) notched at the thicker ends and tied, are hoisted from the outside into a position judged to be the centre of the hut. These are arranged at right angles to one another, the apex being the summit of the roof; the thinner ends where they meet the walls are secured with bark rope (kamba) and an overlap allowed for eaves, which may come to within 4 feet of the ground. These four poles form the skeleton and give the alignment for the position of the remaining "selele," which radiate downwards from it like a half-open Japanese parasol. These are, in turn, strengthened with concentric rings of withes secured with bark rope. Sheaves of dry grass are then arranged in layers 6 inches to a foot thick from below upwards and tied to the underframe. A ceiling of reeds (matete) is sometimes apposed to the inner surface and tied spirally to the framework.

Grass is tied to the skeleton of the wall on the outside and the interstices are filled with a mixture of sand and antheap (kisugulu) softened and made into a mortar with water. Cracks in this are smoothed over with antheap plastering. The door sill is raised to keep out rain, all scaffolding removed, the floor stamped and the hut is ready for occupation, when a grass or reed door, made to slide between two poles, is fixed inside the doorway.

The second type of hut is of a similar general shape and may be described as a hut within a hut, but covered by one roof. This merely adds a circular passage about a yard

in width around the inner hut. This type of hut is usually provided with four doors, two opposite ones for the inner and two for the outer, so arranged that access to the inner is a quarter circle distant from the outer doors.

Windows are rare in either pattern, and air gains entry through the doors or by slow percolation through the eaves and thatch. The interiors are dark and noisome.

Experience and simplicity of erection with the material available have contributed to the evolution of these types of dwelling as affording a comfortable retreat from the inclemency of the weather and the menace of carnivora, and supplying a home and store-house.

The single circular hut is called "misonge," the double one indicates an advance in architectural evolution and is termed "nyumba ya wema."

These huts are occupied principally in the afternoons and after sunset. Most work, even the domestic duties of the women folk are performed out of doors, which, from a sanitary point of view and the nature of their dwellings, with the lack of light and ventilation, is fortunate. Except in the large villages, or one tending to become congested, the Native does not have an enclosure for a backyard, nor is there any semblance of symmetry in the disposition of their dwellings or the topography of their villages.

The Watusi huts are similar in construction, but that they are smaller and grass is largely used. They also have an enclosure of euphorbia or thorn bush round a collection of three or four huts, and alfresco enclosure for cattle.

Customs vary in minor particulars with certain tribes or individuals, but it is usual for all domestic animals—cattle, goats, sheep, dogs and fowls to occupy their huts with the owners and their families. In the double huts, the cattle and goats are frequently given the inner room, while the family occupy the narrow verandah.

Food is cooked inside the huts and the embers help to warm the interior at night.

Temporary quarters are often constructed of grass on a framework of sticks, and are shaped like a beehive with a door 2 feet high. The diameter of a hut is often less than 6 feet, and may be occupied by a family of three or four.

The curtilage of a village is usually found to be kept clear of grass, well swept and clean. This would seem to indicate a communal knowledge and practice of hygiene, but it was disappointing to hear, though the results are beneficial, that this is done to prevent thorns and burrs from injuring them and to keep reptiles from lodging in the village. The surroundings of most villages are insanitary and their personal habits unhygienic. Baths are not a frequent indulgence among them and are most perfunctory. Men bathe more frequently and thoroughly than the women, and the lack of privacy is probably responsible for this. Mothers bathe their children in cold water and in all weathers in the open.

A drop in atmospheric temperature is readily perceived by the Native, and when a European is comfortably cool, the Native's teeth are chattering.

Food.

Animal.—The Natives do not eat the flesh of animals dangerous to man, such as the lion and leopard, nor of scavenging meat eaters like the hyæna and jackal, nor of reptiles and certain wild birds.

They will consume with avidity most other meats when they get the chance, which is not often nor at regular intervals. Beef and the flesh of antelope, zebra, etc., are eaten, nor is the Native particular as to the manner of killing or the time that has elapsed since the animal was killed or died. An ox dead of disease, a carcass left by lion, or an antelope trapped in a pit and dead a fortnight, is meat to them. Some few hunt with primitive muzzle-loaders, bows, arrows and spears. There is a superstition among most tribes that the meat of animals with spots or patches like the bushbuck, giraffe, etc., causes leprosy, and these are avoided.

When abundant, meat is skewered, dried and partially smoked over a fire and kept for a later occasion.

Women are barred by superstition or the fear of ridicule from eating the flesh of goats, sheep, fowls and fish.

Fresh milk and butter are little used, except among the Watusi, the herdsmen. These even anoint themselves with butter and use it as an unguent.

A few of the other tribes take milk, cow's or goat's, but prefer it curdled. Eggs are a neglected food.

Fish.—In pools in the dried river beds and in swamps barbel is caught. Some tribes indulge in this form of food. A type of perch is also found when the rivers are running.

Vegetable. (1) *Cereals*.—Millets, maize, rice, etc., are grown. They form the bulk of the food consumed and are taken as a gruel or mash. Maize is sometimes cooked till it is soft, but whole. The millets are pounded into flour in wooden mortars or ground on the rocks.

(2) *Pulses*.—(a) Beans—several varieties of these are grown. They are cooked separately from the flour and are often mixed with ground nuts or their oil.

(b) Ground nuts—these are extensively used and form the basis of many "side dishes."

(3) *Rhizomes and Tubers*.—(a) Cassava is eaten raw and dried or, if in the form of flour, it is boiled. It does not swell much on cooking and the Native prefers the other flours. It is "famine" diet.

(4) *Vegetables*.—A variety of these are grown and the tender leaves of many plants are used. Whether the vegetable is marrow or wild tomato, it is always cooked. The leaves of several wild plants are also used. Such are often collected and dried for use in time of shortage.

(5) *Vegetable oils*.—The oil of the ground nut is easily procurable and much used. A grain called "ufuta" (sim-sim) rich in oil is also grown.

Fruits.—Bananas, mangoes, sour lemons, oranges, tangerines and papaw are grown in parts and the Natives avail themselves of these fruits when in season. Many of these are foreign to the country. Certain wild fruits are also consumed and the Native shows a keen knowledge of those that are wholesome and those that are not, a knowledge possibly dearly bought by past experience in the tribes. Many labour under the superstition that he who plants a fruit tree will not live to enjoy the fruit. This partly explains why fruit trees are not more plentiful.

Beverages.

Two main kinds of intoxicating liquor are indulged in. The one made from cereals, with or without certain roots, is known as "pombe," and is drunk by the bowlful. The alcoholic content of this brew, judging from the quantities consumed to produce inebriation, is about the same as that of beer.

Into the other known as "kangara," honey largely enters. It is vastly more potent.

Preparation of Food.

Culinary arrangements are in the hands of the woman. It is her duty to choose, collect, clean and prepare the food for her husband and the family and to gauge the amount required to satisfy them. Little is ever left over, and quantity takes precedence of quality.

Cassava (muhogo) and fruit are practically the only foods taken raw.

All other foods are cooked. The usual method adopted is to make a stew, which is a mess of pottage, insipid in appearance and taste.

All the ingredients of the meal are boiled in one earthenware pot, till the meat, when there is any, is like wash-leather, and most of the water is boiled away. This

concoction is called "ugali" and constitutes the principal dish of the day from one end of the year to the other. It is repeated afresh at sunset. It contains for the most part flour, a little meat on rare occasions, beans of various kinds and fresh or dried vegetables or leaves, with salt to taste.

With the more fastidious the meat may be semi- or completely roasted separately from the flour matrix and the beans boiled in water and fried in ground-nut oil.

Vegetables may be similarly treated and all are classed in relation to the flour as "kitoweo," adjuvants to appetite savouries. Flour, it will be noticed, is the basic principle of the meal and supplies the bulk. The remainder, the meat or vegetable, is the "ketchup." Different individuals add some special herb or condiment of their acquaintance to improve the piquancy of the meal.

"Uji" is a gruel, composed of a mixture of flour from several cereals or one alone. It is often the first dish of the day, but is discarded in favour of "ugali" when the latter is available. It may be taken with honey. Infants from birth to a few days old are often fed on this "poison" unfortunately.

No green vegetable is eaten raw. The young leaves of the cassava plant, the pumpkin and certain beans are used as vegetables. A wild spinach, and the leaves of certain wild plants growing in deserted villages, swamps and on hillsides are used. Fresh leaves are used in the rainy season, but to tide over the period of drought a large quantity of fresh leaves are collected and partially cooked and allowed to dry or sun dried and stored. The dried leaves and vegetables used for food are called "nsansa."

A list of the Native names for many of their foodstuffs is appended.

It will be seen that the staple diet is cereal.

The times at which meals are taken vary a little between the eastern and western tribes. A midday meal and one at sunset is usual with the former. Fruit, vegetables and alcoholic drinks are not considered to constitute a meal, and are taken as chance offers at any time. The latter have a morning and evening meal, with "snacks" at three-hourly intervals between. The times are modified in the planting season.

The amount consumed by each person is variable, but average a kilogramme at a sitting, or four and a half pounds a day. The Native eats to repletion and children have enormous appetites. It is possibly because their staple diet is carbohydrate that most of them have dilated stomachs.

As a rule the men dine separately from the women and before them. All sit round and dip into a common vessel, the one for the men being different from that for the women. People of different tribes were accustomed to feeding apart, but the custom is dying out, and they sometimes feed together. The reason for this is stated to be that the personal odour of certain tribes is obnoxious to others and the repulsion is mutual.

Characteristics.

The people are simple and ease-loving. They work when they must, and avoid it when they can. Their physique is good on the whole, which is the more remarkable when one considers the diseases to which they are exposed from birth onwards. It would appear as if they had acquired a high resistance to many of these through the ages, the toll of human life exacted in the process being high. The fittest survive. Their stamina on occasions is remarkable.

They are a cheerful people, and have the saving grace of a sense of humour—crude, as a general rule, but showing curious spasmodic streaks of refinement. They will undertake long and arduous marches with heavy loads, and cheer up towards the end of the march—the time it is most needed—when one of their number starts a song, the remainder picking up the refrain.

They are illiterate, impecunious and improvident. Intellectual haziness leads them into a duplicity and this mild deceit is very transparent, but exasperating, when information is required. With foreigners, cautious and evasive replies to enquiries are considered to be necessary. Money is squandered as quickly as gained.

Occupations.

The Wanyamwezi and Wasumbwa are husbandmen during the monsoon, and turn their hands to beehive-making and the collection and clarification of honey and wax for sale when their own needs are satisfied. The refining of salt and catching of fish are some of their dry weather occupations. Some migrate to the coastal and other districts for work, and others obtain money from the portage of goods. A few fashion wooden stools and spoons, make rush baskets and mats, or boxes from "miombo" bark. These are not looked on as an industry so much as a spare time occupation.

The Watusi are herdsmen. They cultivate but little. They earn extra when necessary by the sale of milk and its products, and volunteer to tend the cattle of the other tribes, receiving in exchange the right to the milk. They are stated to be dishonest in their dealings and to be cattle thieves. They are said to alter the markings of cattle entrusted to them with stains and by other means, or to drive them to the distant camps of relatives or friends, and report that the animals were killed or died.

They have no standards of hygiene. Milk for sale is adulterated with cow's urine ; but, strange as it may sound, this is less dangerous than, and preferable to, dilution with the filthy water from their pools.

The collection of honey and wax is one of their occupations, and they are expert at it.

Curiously enough, they do not often sell their cattle or sheep for slaughter, and while they are not averse to beef or mutton, they do not kill their own animals. Any that die from disease or accident are devoured readily enough.

The Walongo ironworkers, who fashion agricultural implements belong to this tribe.

Among all these tribes the women do all the light work and the men the heavy work as it occurs.

The cutting and paring of timber, etc., for building, the erection of huts, tillage, portage, beehive-making, etc., is the work of men, though there would appear to be no hard and fast rule as to whose work it is to till the soil. Women have as frequently been seen at this occupation as men. Sowing, weeding, harvesting, threshing and garnering is left to the women, the man assists in heavy clearing and other small ways when inclined. It is the duty of the males, however, to guard the crops against the depredations of baboons and game.

Habits and Customs.

Distinctive tattoo marks on the face and body are used by the different tribes. These marks take the form of lines or circles, and women bear the marks more frequently than men. The males of these tribes file the upper incisor teeth into the form of an inverted V. These rites are performed at or near puberty. The form of marking favoured by the Watusi are circles and semicircles on the chest and abdomen.

Females of the Wanyamwezi and Wasumbwa wear anklets and bracelets of copper wire, those of the Watusi anklets of lead wire and bracelets of copper. The weight of these anklets exceeds a couple of pounds, and with one imposed on another, extend sometimes from ankle to knee. The wearing of these "ornaments" by men is optional.

Marriage.

Women are considered to be chattels, wealth, and an asset. They are wives as well as servants, and do most of man's work and procure his food, and polygamy is the rule. It is not uncommon for a man to have two or three wives. More than this he does not appear to be able to control, and dissension in the home results. On occasion a man has more wives than three, but he is careful to house them in different villages. Men of wealth and standing like the chiefs may have as many as 10 or 15 females in their household.

Marriages are usually contracted after puberty, the husband being almost invariably senior to his wife, often by many years. Child marriage is not uncommon, but consummation of the marriage is usually postponed till puberty. It is uncommon to see a girl of 12 to 16 years of age with a child.

Among the Wanyamwezi and Wasumbwa the man who wants to get married pays dowry in the form of cattle, sheep, goats, agricultural implements, clothing or money to the parents of the girl. The man obtains the consent of the girl and, through the agency of witnesses, usually old men, who are sent to parley with the parents, the amount of the dowry is fixed. If too high a price is demanded, further parley and bargaining ensues, till a satisfactory agreement is reached or negotiations are broken off.

Should a girl desire to marry the man of her choice without dowry she is permitted to do so, and her parents have little voice in the matter.

In the case of intermarriages between Watusi and other tribes, the giving of a marriage settlement, or not, is a matter of mutual arrangement.

The Watusi have a reputation for being extremely hospitable in their own tribe and it is stated to be customary when one of the tribe is on a journey and comes to a village of his own people, even though he be a stranger to them, that he plants his spear near the doorway of a hut. This entitles him to the hospitality of the owner—a very commendable custom in its way, except that this hospitality extends to cohabitation with the women folk as well, to which he is also entitled.

Legal cognizance and responsibility is attached in the Native court to the marriage endowment. A woman so endowed may not leave her husband or be divorced till her parents have returned to the husband in full the original amount of the settlement, or unless she has had several children by him.

A woman consenting to marry a man without payment may leave him at any time and marry another without legal responsibility.

A variant to this procedure might be termed "probationary marriage." The man takes unto himself a wife with consent, and pays nothing to the parents, till she has borne him a child. This payment gives him ownership of the child.

The man may divorce his wife at any time.

The ease with which divorces can be obtained accounts for the frequent histories one hears of women having had more husbands than one, and marriages after the first are not usually ratified by settlement.

Female children are more valuable than male. Their value is assessed at three head of cattle or fifty shillings, as opposed to two head of cattle and thirty shillings for a boy.

While there is more evidence of the existence of parental affection for children, it is curiously more apparent in the father. Whether the monetary value of the child influences this or not is an open question. When deserting their husbands wives have been known to hand over their children to his care without apparent compunction. They are not, however, very demonstrative in public and joy or grief are rarely depicted on their countenances.

On reaching puberty—between the ages of 12 and 14 years—children are not permitted to occupy the same hut as their parents. The parents build a new one in the vicinity for their children.

At this time, while a form of parental control still abides, the children have much greater liberty and are not long in abusing it. It has been elicited in their histories that many have contracted venereal diseases for the first time at this stage of their career.

It is unlikely, living as they do in the confines of a small hut, that there is much that is new to be learnt by the boy or girl of 12 or 14 in any initiation rites that may be performed by the elders of the tribes. Their initiation would appear to commence at a tender age, as early, in fact, as any intelligence develops, and in matters sexual they are precocious.

Pregnancy.

In most families, to become pregnant is looked upon as being God's will, while sterility is ascribed to the agency and interference of evil spirits.

In the latter case, the witch doctor is called in consultation.

Married women becoming pregnant during the long continued absence of the husband are taken back into the fold on his return without ceremony, more particularly if the child be a male. He may, of course, divorce her, but his own morals during his sojourn afar have not been of the highest order.

In consequence of the elasticity of Native customs and codes, the looseness of the marriage knot and its close semblance to a business transaction supported mainly by aged witnesses and the simplicity of divorce proceedings, "illegitimacy" is a term difficult of definition in so far as it concerns Native children. In the light of a western code it is rife. Locally, it barely exists. The aspect is relative.

Abortion.

Information on this subject is necessarily difficult to obtain, for, apart from the natural reticence of the female, she has a faint consciousness that the induction of abortion is a penal offence.

Accidental abortion or miscarriage is attributed to fate. It is more often due to syphilis.

The reasons for inducing abortion among the Natives would appear, generally, to be the same as obtain in more civilized countries—dislike of children, fear of the pains of travail, displeasure with husband and spite against him, and occasionally, disgrace, if unmarried, or in the absence of the husband. The last reason is not a cogent one among the Wanyamwezi or Watusi, nor among the sect referred to later and known as Waswezi of whatever tribe.

The expense and education of children is not a factor that concerns the Native in the limitation of a family.

Jealousy and the custom that a Native woman is not permitted, during pregnancy and after it till the child is able to walk, to cohabit with her husband or indeed any man, is occasionally responsible for the practice, among the sexually morbid. This rule is occasionally relaxed and a husband is permitted to live with his wife at intervals of two or three months after she has been delivered.

It is curious that the origin of the custom is stated to be the fear of the female of conceiving too soon after her delivery, a fear opposed to the popular belief in Occidental countries that conception during lactation is rare.

The "nuisance" of having a child saddled to one for a year or two is also given as a possible reason.

The Bafumu or witch doctors, referred to again later, are the people consulted and they are stated never to attempt interference after the third month from the date of conception, because of the danger to the mother. It is well that they recognise even so much.

It is claimed that the Bafumu are able similarly to check a threatened abortion, and to present conception temporarily and permanently by means of medicine and witchcraft.

Contraceptives of a mechanical nature have not been devised; medicinal and magic contraceptives in the form of talismans known only to the Bafumu, are reputed to be potent and efficacious. Blind faith in their witch doctors amounts to a religion.

The medicinal remedies are the secret of the medical fraternity. Enquiries into the nature of the roots and herbs employed, and their manner of preparation and use in this connection have, hitherto, been a failure, notwithstanding offers of remuneration.

The use of these medicines is stated to produce the desired result sometimes. From descriptions given of one or two methods employed, one is inclined to think that

supple twigs about 6 inches in length of the "euphorbia" bush or possibly "oleander" are inserted into the vagina, the escharotic milky juice of these plants causing a cervical irritation and diapedesis. The identification of these plants awaits confirmation, however. It would be a curious coincidence were these plants identified, as their use in the Orient for the same purpose is often met in forensic medicine.

Investigation into the manner of use and the nature of talismans and amulets has met with greater success. Most of these can be described as superstition, pure and simple, and one or two unconsciously, perhaps, prescribe certain athletic feats calculated to produce abortion.

From a survey of their customs, there is little incentive to the induction of abortion, and it can be stated that the practice among the Wanyamwezi, the Watusi, and the Baswezi of any tribe, is rare. It is reported to be common among the Wasumbwa, but we have no evidence of this either in our hospitals or indirectly. Syphilis has been found to be the cause of the few abortions and miscarriages that we have had to deal with, and from their customs, it is little wonder that venereal diseases are rife.

Confinement.

A pregnant woman is engaged in her domestic duties up to the time of the onset of severe labour pains. Those of her elderly female relatives and friends that are available are then hurriedly summoned and the confinement conducted as here described.

The attendants rub oil of ground-nuts on the abdomen of the pregnant woman, pour tepid water over it and massage gently. This continues spasmodically till the membranes rupture, when the woman sits on the ground leaning slightly backward and with her legs spread apart. One old attendant sits or stands behind and supports her shoulders, sometimes pressing her knees or feet into the small of the patient's back. Another places herself in front and keeps the patient's knees pressed to the ground. Thus disposed they await events. When both child and placenta are born, the umbilical cord is taken up and the blood in it, considered injurious to the child, is squeezed towards the placenta. With the cord still held tightly, it is cut with the outer sheath of the millet plant, 2 to 2½ inches in the case of a male and 1 inch in that of the female, from the umbilical attachment. This portion of the cord is tied with grass or fibre at its extremity, and again close to the umbilicus, when the first knot is loosened.

They are clumsy at tying knots, and inadvertently, perhaps, drag unnecessarily hard on the cord. No dressing is used. The cord is left exposed and dries in three to four days. If it has not fallen off in this time, the process is assisted by torsion. The mother is perfunctorily washed, and the child has sand and grit wiped off its body with any rag handy. Sand is strewn on the ground to absorb amniotic fluid and blood and then swept up. The after-birth is buried uterine surface downward inside the hut or just outside, near the door.

Complications and their Treatment.

Delayed or difficult labour is attributed to the violation of a taboo or departure from the path of moral rectitude. In these cases, and when a woman, being pregnant, has transferred from one to another sultanate, the confinement is conducted not in the house but in the plantation.

Should there be delay in the delivery of the placenta from any cause, tapping of the mother's back from the shoulders to the sacrum, with the thick stick used for pounding grain, is believed to induce separation and delivery. Failing this, traction on the cord by the hand or by suspending a two-pound stone from it, and even manual removal, is resorted to.

Assistance is only considered necessary for the first child. A primipara, therefore, has elderly female relatives and friends with her. For the second and subsequent children she is expected to know enough to fend for herself.

From the date of delivery to the cessation of the lochia, massage with ground-nut oil, followed by the pouring of tepid water over the abdomen, is done three or four times a day.

The mother remains in her house and goes about her ordinary avocations within doors. She does not lie down unless inclined. This seclusion is maintained for five days if she has borne a male, and four if a female child.

Breech presentations and twins are an abnormality requiring the performance of certain rites and the use of medicine and talismans to avert disease or other curse and to increase the supply of mother's milk. The rites are performed by people who have in the past been visited with a similar infliction, and last four days to the accompaniment of beating of drums, singing and screaming. At the end of the first or second year, if the children are still alive, the parents have to invite all who took part in the initial ceremony to a carouse. A presentation to the chief has also to be made.

Should one of the twins die, the other wears through life a talisman representative of the deceased. This talisman shares all the pains and pleasures of life with the wearer. It is done in this wise. While taking food, for instance, the talisman must be touched with the food first, and is believed to have benefited by its ingestion.

Feeding of Infants.

Colostrum is counted unclean and even poisonous. An infant is not allowed to its mother's breast for the first few days. The witch doctors are reputed to be responsible for this popular idea. They have also spread the belief, it is alleged, that the mother's milk will not commence to flow without their assistance. The medicine men are reported in many instances to induce secretion by sucking the breasts. Confirmation of this loathsome custom has been received from sources widely separate. In the meantime the child is fed on cow's milk undiluted or gruel of millet flour, often only partially cooked. In either case the procedure is the same. The mother squats on the floor or a low stool, with the child reclining in her lap against her left arm, the left hand being free. The right hand is cupped and the food poured from the spout of the gourd containing it into the palm. The child usually cries during the operation, and this facilitates its feeding. Should the infant splutter, choke or vomit, it is given more, and the mother assists its temporary retention with pushing the food in with her thumb. The mother is the judge of the quantity required by her infant, and the gauge of satiety is the degree of distention of the abdomen. When the skin is tense and shiny the child is deemed to have been adequately fed, and is hoisted on the mother's back and kept there with a cloth wound round the mother and child and tied in front. Retaining the remainder of the food for the next meal or swilling the gourd out with water and wiping her hands on her clothes, the mother proceeds with her hoeing or planting or other occupation. In eight or ten days, if the child is still alive—and it is surprising how many survive this gross abuse—it is permitted the breast as often as it pleases and whenever it is procacious. Regular feeding is unknown; the child cries for one reason only—food. If the crying is persistent and food refused, it dawns on the parent that something is amiss, and she consults the witch doctor when the home remedies known to her have failed. In cases of this kind the witch doctor informs the mother that the child has been wrongly named and is crying for a new name—that of its grandparents. This means a ceremony has to be performed. Should the mother be occupied and the child peevish, the breast is dragged under the arm and passed to the child on her back. Women suckle their infants till they are able to walk—that is, up to the twelfth or fourteenth month—and children of two and three years have, frequently enough to deserve mention, been seen at the breast. Weaning is a process that starts when the child is able to indicate by groping, pointing and crying, its desire to have something the mother is eating. No restraint is put on the child's appetite. It may have all it desires, from sand to the food of adults. Toddlers have been seen drinking Native beer.

The continued and irregular feeding on breasts not permitted to refill, the dragging of the breasts, the constriction of the cloth securing the infant to its mother, and the laxity of the tissues in the tropics, there is little doubt tend to produce the flattened, flaccid, pendulous breasts so often seen among even the younger African women.

Nomination of Children.

The nomination of children takes place at or shortly after birth among the two main tribes. No ceremony attaches to nomination, as far as is known ; the name is given by the mother or attendants, apparently. The Watusi name their children at the time of eruption of the temporary teeth.

There is evidence that a rough system is in use in the choice of names ; the system has the advantage of simplicity and saves mental effort. The father apparently has little interest in his children's names. Male names usually have a female counterpart, and some are adaptable to either sex. Twins have usually a set combination of names, and often additional ones. The variety of appellations is not great, and the cognomen is that of the father or of the husband among married women. Names are sometimes changed as desired, merely because an alias is often useful, and among the Wangoni, because mention of the name of the father, if deceased, is calculated to rouse the ire of his spirit, with unpleasant consequences. Wrong names are frequently given with intention to foreigners, in consonance with their habit of deception, on the principle that they do not understand the use, to their disadvantages, that may be made of the information vouched. These names are fabricated on the spur of the moment and quickly forgotten. This is a frequent source of annoyance to those engaged on entering names in the admission books of the hospitals when it is necessary that a patient be traced.

A few of the principles governing the choice of appellation are given below ; most are associated with circumstances obtaining at birth and the sex of the child.

- (1) Locality—whether in a hut or in the open. In regard to the latter, whether on the road, in the forest, the plantation, etc.
- (2) Time of day—before sunrise, day time, evening, late evening, and night. The hour of birth may be a name.
- (3) Season of year—wet or dry weather and subdivisions of these. Names relative to times of famine or plenty are also bestowed.
- (4) Labour—whether difficult or easy, delayed or quick.
- (5) Position and presentation of fœtus—anterior or posterior, vertex or breech.
- (6) The health of the mother during pregnancy may determine the child's name.
- (7) Condition of the child—fat, lean, puling, etc.
- (8) Abnormalities—supernumerary digits, etc.
- (9) Adventitious circumstances obtaining at birth.
- (10) Parents' or grandparents' names.

Witchcraft.

The Bafumu are the witch doctors. Their calling is hereditary, though novitiates may be enrolled in the brotherhood in special circumstances and on payment. They are ordinary people of the tribe whose ancestors have claimed pretentious powers in relation with evil spirits. They are graded according to their capabilities and specialities. Some lay claim to an ability to control the seasons, to bring down the rain in torrents or assuage the severity of a storm ; others claim the power of causing the rain to cease entirely and bring drought. Both are in the same fraternity and work hand in glove, making a pretence of blaming each other should a demonstration of their power be a failure. Others, again, specialise in divination and spells. All are accredited with extraordinary knowledge of disease and its cure, in different degrees. The witch doctor may pursue quite ordinary avocations till called on in a professional capacity, when he adopts a solemn aspect and a wild attire, into which enter the skins and claws of wild animals, feathers, beads, strings, shells, and a weird head-dress.

The fraternity is looked on with respect amounting to awe, and their injunctions are strictly followed. An instance will suffice to demonstrate the strong and abiding faith of the peasant in his medicine man. A lion, too old to hunt, was recently reported to have worried cattle at a village close by. The animal was routed out of a thicket by two or three men armed with bows, arrows, and spears. Two of the attackers were badly mauled when the lion was wounded. They retreated and repaired to the hut of the witch doctor, who, having collected his fee, distributed talismans to several men who, secure in the belief that they would be rendered invisible or immune to injury, advanced to the attack with more foolhardiness than prudence. The lion was killed, but not before it mauled several, two so badly that they succumbed to their injuries. Describing the failure of the charm to protect them from injury, the survivors were quite willing to attribute it to some error of their own in following instructions. What could we not do were half this confidence reposed in us. Their practice is secret, and while they may delude themselves into a belief in their own powers, they are wisely loyal among themselves.

Serious doubts are entertained as to the belief of the witch doctor in his own powers. They are willing to admit to a foreigner, if alone, that their pretensions are greater than their ability, and we have, on several occasions had among our patients for a variety of conditions, these very medicine men. On seeking advice for themselves they do not, however, reveal their profession, but have been recognised by others, whom they least expected to meet. They play for their own safety, in ensuring secrecy by threats of dire disaster to the miserable wretch who seeks advice, or at least to the annulment of the contract and its efficacy, if a word of the injunctions conveyed or the manner of their administration of drugs is divulged to a soul. The drugs themselves are collected by the medicine man, and he thus secures that they remain proprietary, and that his knowledge is imparted to no one. The western principle in relation to medicine would soon deprive him of his living, and he knows this. All advice is paid for in money or kind, and the practice is lucrative.

With a view to obtaining information as to their methods, friendly advances were made, and one with grave misgiving lest he be seen or reported to his fraternity, slipped into one of our clinics and was shown its working, its stores, its instruments, etc. In the drug store he was constrained to ask why so many types and sizes of bottle were used for the one drug. His reference was to a variety of drugs which were white. The same man was invited to witness an operation—amputation of the breast. His interest in the preparations, sterilisation, instruments and technique was casual to indifference. He wore a face like a mask, and probably thought all these were evolutions similar to their taboos, but his face radiated interest in the wonder of the medicine that permitted a patient to sleep unperturbed through an operation. The anæsthetic excited his admiration. He was offered employment in the hospital, and was told he would be trained. He refused, and it was to be gathered that it was as much as his livelihood was worth that he had been bold enough even to attend at our invitation. The gentleman has not been seen since.

Apart from the treatment of disease, he makes synteresis a part of his accomplishments, and to this end specialises in certain "mitambiko," or taboos, which, in slack times, maintain his revenue.

They play upon ignorance, the credulity and the superstition of their people. They devise superstitions encompassing a variety of circumstances and conditions to their advantage.

They include in their pharmacopœia herbs, roots and the excreta and venom of snakes, rendered harmless by incineration. Into the ritual employed they introduce charms, spells and abracadabra freely. It is blatant quackery, and failure is ascribed to God's will, evil spirits, or violation of the terms of the taboo. With this their dupes are expected to be and are surprisingly content. Their medicines are empirically used

and results are often drastic. Taboos are of eight or ten different types, and have for their object any purpose from the reconciliation of enemies to the prevention of disaster, from removing the influence of an evil spirit preventing a woman from becoming pregnant, to appeasing the spirits of the dead for other purposes. Even patients who have consulted the Bafumu, without benefit, and have been cured of their disease in a clinic, carry out the ritual of the taboo on their discharge.

Some of these ceremonies involve the sacrifice of animals which are afterwards eaten, the imbibition of quantities of liquor, the beating of drums, singing and screaming, and wild dancing.

A sect, believed to have been originated some years ago by the Bafumu, are styled the Baswezi.

It purports to have a religious basis, and ancestor worship is indulged in. If this were all, however, it would not much matter. One of their proceedings is to hold inter-urban dances, on the pretences of a taboo ceremonial, to which both sexes are invited, and after the usual carousing and wild dancing, they pair off and disappear into the bush and indulge in promiscuous intercourse. The ceremony may last a few days. It is not surprising that with tenets so near the Native's heart, the sect has many staunch adherents, and include most of the chiefs.

The prevention of incest and inbreeding is not a motive actuating this orgy.

The Bafumu see in the establishment of our clinics and hospitals a possible menace to their reputation and power over the Native ; he foresees a very real rivalry and menace to his livelihood in that treatment is free in the Government institutions. It is not to be wondered at then that he is secretly and actively inimical to our endeavours, and makes the most of any chance he may get to discredit western practice.

There is little doubt that the rumours crediting the European with the failure of the last monsoon, on the grounds that he withheld the rain to enable the erection of hospitals to be completed, and its sequel, that the epidemic of sleeping sickness was introduced by him to fill those hospitals, originated with the Bafumu.

In the early days of the epidemic, when the focus was circumscribed, we took special trouble on tour in the district, and at a meeting of chiefs, in Kahama, to explain in detail for their intelligence, the etiology of the disease. They were shown patients, the blood parasite, and the fly and the cycle was explained in simple language. The means of prevention of spread were explained. The chiefs expressed wonder, as well they might, and politely acquiesced in all that was said. One or two raised queries on points of doubt. On their return, they evidently had opportunity to discuss the question, and all explanations were wiped off the slate by the irrefutable observation of one hoary head at the meeting, "What nonsense is this about tsetse and sleeping sickness? Have we not had the fly with us ever since we can remember, and is the disease not new?" Naïve and effective, the remark checked all further argument, and left his audience to form their own conclusions. The Bafumu were first in the field, and are at an undoubted advantage in having the faith of the populace. It will be some time before we are able to win over the people from the more harmful of their superstitions and customs. The Bafumu are a formidable secret enemy, both to us and their own kith and kin.

A mass of information relative to the life-history of the Native has been collected. Much requires confirmation ; some has to be further investigated. Details are available of the procedure in many of their taboos and of their objects. Details of the ceremonial dresses and instruments used on these occasions have also been obtained with difficulty. Information in reference to a variety of superstitions and customs not relevant to a report of this nature have been intentionally withheld. Those referred to in this section are the principal ones with which in our work we are concerned, and bear directly on and explain the incidence of several of the more prevalent diseases.

METEOROLOGICAL RETURN: KAHAMA DISTRICT (1928).
Kahama Township—Altitude, 4,000 feet (approximately).

Months.	Temperature.				Rainfall.				Wind General direc- tion.
	Shade maxi- mum.	Shade mini- mum.	Range.	Mean.	Amount in inches.	Degree of Humidity.	No. of days on which rain fell.	Maxi- mum fall in a day.	
January ..	—	—	—	—	4.31	—	8	inches. 1.16	Morning: East South East. Evening: West North West.
February ..	—	—	—	—	4.03	—	7	0.77	
March ..	—	—	—	—	8.67	—	14	1.2	
April ..	88.68	59.48	29.20	14.60	1.93	68	13	0.9	
May ..	89.60	64.42	25.18	12.59	0.24	67	4	0.11	
June ..	83.49	60.19	23.30	11.65	—	47	—	—	
July ..	85.68	57.84	27.84	13.92	0.23	53	1	0.23	
August ..	85.65	60.09	25.56	12.78	—	47	—	—	
September ..	89.75	66.16	23.59	11.79	—	44	—	—	
October ..	88.42	63.47	24.95	12.47	3.74	49	5	2.02	
November ..	83.66	64.43	19.23	9.61	1.26	53	5	0.95	
December ..	82.11 $\frac{1}{2}$	63.59	18.52	9.26	7.74	72	15	2.00	

Runzewe—Altitude, 3,936 feet.

Months.	Temperature.				Rainfall.				Wind. General direc- tion.
	Shade maxi- mum.	Shade mini- mum.	Range.	Mean.	Amount in inches.	Degree of Humidity.	No. of days on which rain fell.	Maxi- mum fall in a day.	
January ..	—	—	—	—	—	—	—	inches. —	Morning: East South East. Evening: West North West.
February ..	—	—	—	—	—	—	—	—	
March ..	—	—	—	—	—	—	—	—	
April ..	80.98	63.68	17.30	8.65	—	54	—	—	
May ..	81.10	62.40	18.70	9.35	—	58	—	—	
June ..	83.44	57.43	26.01	13.00	—	43	—	—	
July ..	85.51	48.53	36.98	18.49	—	36	—	—	
August ..	85.92	56.54	29.38	14.69	0.7	29	1	0.7	
September ..	82.09	58.58	23.51	11.75	1.49	43	2	0.75	
October ..	86.79	58.97	27.82	13.91	2.26	49	8	1.22	
November ..	85.64	60.11	25.53	12.76	3.99	48	7	1.00	
December ..	81.01	60.63	20.38	10.19	4.47	60	9	1.20	

Itaranganya—Altitude, 4,264 feet.

Months.	Temperature.				Rainfall.				Wind. General direc- tion.
	Shade maxi- mum.	Shade mini- mum.	Range.	Mean.	Amount in inches.	Degree of Humidity.	No. of days on which rain fell.	Maxi- mum fall in a day.	
January ..	—	—	—	—	—	—	—	inches. —	
February ..	—	—	—	—	—	—	—	—	
March ..	—	—	—	—	—	—	—	—	
April ..	—	—	—	—	—	—	—	—	
May ..	—	—	—	—	—	—	—	—	
June ..	—	—	—	—	—	—	—	—	
July ..	85.34	59.72	25.62	12.81	—	36	—	—	
August ..	85.29	60.89	24.40	12.20	0.2	33	1	0.2	
September ..	88.15	63.10	25.05	12.52	2.82	41	3	2.75	
October ..	85.72	63.48	22.24	11.12	6.62	59	9	3.75	
November ..	84.74	63.92	20.82	10.91	2.31	63	5	1.00	
December ..	81.23	62.79	18.44	9.22	5.25	68	16	0.86	

METEOROLOGICAL RETURN: KAHAMA DISTRICT (1928)—*continued*.
Uyogo—Altitude, 3,936 feet.

Months.	Temperature.				Rainfall.				Wind. General direc- tion.
	Shade maxi- mum.	Shade mini- mum.	Range.	Mean.	Amount in inches.	Degree of Humidity.	No. of days on which rain fell.	Maxi- mum fall in a day.	
								inches.	
January ..	—	—	—	—	—	—	—	—	
February ..	—	—	—	—	—	—	—	—	
March ..	—	—	—	—	—	—	—	—	
April ..	—	—	—	—	—	—	—	—	
May ..	—	—	—	—	—	—	—	—	
June ..	86·57	57·75	28·82	14·91	—	81	—	—	
July ..	84·55	56·50	28·05	14·02	0·03	37	1	0·03	
August ..	86·09	60·13	25·96	12·98	—	35	—	—	
September ..	89·60	63·43	26·17	13·08	1·49	31	3	0·85	
October ..	88·35	63·45	25·00	12·05	2·26	39	8	0·62	
November ..	88·48	63·48	25·00	12·05	1·03	41	7	0·025	
December ..	82·40	62·55	19·85	9·92	5·94	62	14	0·87	

CENSUS FIGURES FOR KAHAMA DISTRICT.

Sultanate.	Mwanangwa.	Gunguli.	Male adults and children over one year.	Female adults and children over one year.	Male children under one year.	Female children under one year.	Total.
D—1 Kahama.	Nhiba ..	Mwamva ..	237	296	16	11	560
	Nkinga ..	Mwendakulina ..	514	746	34	38	1,332
	Mabuga ..	Busoka ..	380	508	20	17	925
	Swakala ..	Kinamuwa ..	462	591	34	28	1,115
	Nkargwa ..	Kinaga ..	768	922	42	48	1,780
	Hafumu ..	Lugera ..	442	612	22	36	1,112
	Ndokezi ..	Jana ..	321	391	31	14	757
	Kulomwa ..	Igegu ..	408	480	32	16	936
	Kihongwe ..	Nyansimbi ..	447	879	37	32	1,395
	Mbusi ..	Isegehe ..	1,232	1,394	93	90	2,809
	Msesa ..	Isaka ..	678	728	39	42	1,487
	Kwangu ..	Ngongwe ..	273	431	29	90	823
	Ndalo ..	Mpera ..	667	897	70	75	1,709
	Mayila ..	Malunga ..	451	563	22	26	1,062
	Ndakami ..	Kalunde ..	778	1,136	41	44	1,999
	Kilundu ..	Budushi ..	911	1,239	56	86	2,292
	Total ..		8,969	11,813	618	693	22,093
D—2 Usumbwa,	Mkete ..	Masambi ..	1,187	1,479	53	67	2,786
	Shizya ..	Utambala ..	239	318	18	7	582
	Shikaka ..	Usonge ..	285	348	20	15	668
	Kazyoba ..	Kumsanda ..	864	1,009	57	61	1,991
	Mwenda ..	Ulumbaga ..	237	281	9	17	544
	Kipamila ..	Ulewe (2) ..	215	266	5	5	491
	Mgabe ..	Nabagana ..	531	563	27	45	1,196
	Nimazyia ..	Ikuzi ..	494	607	41	53	1,195
	Kivurunga ..	Ulewe (1) ..	414	533	15	21	983
	Lunde ..	Ulangwa ..	221	291	8	23	543
	Joseph ..	Mission ..	186	230	8	6	430
	Kuyela ..	Kondebona ..	499	665	41	32	1,237
	Karoli ..	Igulwa ..	500	654	14	18	1,186
	Kilino ..	Nambiro ..	446	580	38	60	1,124
	Ndelele ..	Mwangoea ..	275	402	11	10	698
	Makwaya ..	Lyobahika ..	303	363	19	21	706
	Kinabuha ..	Kasilu ..	861	1,000	69	73	2,003
	Mhindwa ..	Mshingikwa ..	288	182	11	19	500
	Total ..		8,045	9,771	464	553	18,533

CENSUS FIGURES FOR KAHAMA DISTRICT—*continued.*

Sultanate.	Mwanangwa.	Gunguli.	Male adults and children over one year.	Female adults and children over one year.	Male children under one year.	Female children under one year.	Total.
D—3 Ngogwa	Masonhwe ..	Buyange ..	270	366	20	21	677
	Mayaya ..	Masumbwe ..	506	675	34	26	1,241
	Mizilo ..	Ngogwa ..	430	567	29	13	1,039
	Ngalula ..	Wilungwa ..	390	532	31	25	978
	Sanduku ..	Lowa ..	143	225	9	9	386
	Kagozi ..	Segese ..	390	469	14	34	907
	Maduru ..	Itaranganya ..	501	597	30	24	1,152
	Kudililwa ..	Nuja ..	297	429	21	17	764
		Total ..	2,927	3,860	188	169	7,144
D—4 Ukamba	Salehe ..	Karimba ..	316	320	12	21	699
	Kinduwanga ..	Buduba ..	236	258	11	12	517
	Sengelwa ..	Baseka ..	279	377	12	14	682
	Moiwa ..	Mihida ..	214	242	14	11	481
	Mpina ..	Butende ..	145	211	7	10	373
	Mirambo ..	Giriwe ..	223	354	16	16	609
	Masesa ..	Itebele ..	100	117	8	5	230
	Tuli ..	Nyandekwa ..	56	69	1	1	127
		Total ..	1,569	1,948	81	90	3,688
D—5 Mbogwe	Machene ..	Itumbili ..	572	805	30	40	1,447
	Ntumbirizyo ..	Lwambogwa ..	118	139	23	19	299
	Kapulilo ..	Nambale ..	383	428	38	32	881
	Mwilima ..	Lulindy ..	246	239	24	8	517
	Malila ..	Mole ..	199	322	20	21	562
	Shigera ..	Busanja ..	496	564	20	30	1,110
	Kinena ..	Mtundu ..	143	183	37	18	381
	Ihuta ..	Malenge ..	171	207	71	73	522
		Total ..	2,328	2,887	263	241	5,719
D—6 Uyogo	Kibaye ..	Kalunde ..	351	472	12	11	846
	Mhwero ..	Kilengwe ..	195	279	17	15	506
	Mihambo ..	Lusanga ..	427	318	24	31	800
	Shimo ..	Mungwi ..	630	827	148	145	1,750
	Mtani ..	Manuagu ..	452	319	18	17	806
	Nzimile ..	Itumba ..	217	155	12	7	391
	Ilogi ..	Kagilangobola ..	259	208	52	70	589
	Myoka ..	Kadati ..	255	210	9	7	481
	Kuli ..	Kakebi ..	86	120	7	6	219
	Bugumba ..	Lugela ..	359	474	52	26	911
		Total ..	3,231	3,382	351	335	7,299
D—7 Msalala	Ngalihya ..	Nyangota ..	140	218	6	9	373
	Nkwabi ..	Nyamigege ..	151	188	8	8	355
	Malembeka ..	Malilita ..	592	703	38	36	1,369
	Nsabi ..	Nyahwale ..	414	612	26	33	1,085
		Total ..	1,297	1,721	78	86	3,182
D—8 Busangi	Madalali ..	Ntobo ..	433	577	32	45	1,087
	Kayobo ..	Bupongo ..	349	380	24	31	784
	Mbati ..	Gula ..	311	441	21	22	795
	Ntabo ..	Mpangara ..	183	295	15	9	502
	Sululi ..	Bunakoba ..	83	113	3	5	204
	Shimbi ..	Busangi ..	215	308	11	16	550
	Malihu ..	Lunguya ..	392	564	151	100	1,207
		Total ..	1,966	2,678	257	228	5,129
D—9 Blungwa	Salamba ..	Shelezo ..	349	314	19	24	706
	Mabula ..	Bukuba ..	471	616	37	19	1,143
	Mpagara ..	Shaka ..	242	323	10	9	584
	Maganga ..	Makongoro ..	499	513	26	22	1,060
	Mbanya ..	Nondwe ..	224	303	11	9	547
		Total ..	1,785	2,069	103	83	4,040
D—10 Ungoni	Zongandaba ..	Bukamba (2) ..	137	199	63	66	465
	Baramwezi ..	Bukamba (1) ..	202	287	33	36	558
		Total ..	339	486	96	102	1,023
D—11 Bugomba	Mambo ..	Migamba ..	213	248	10	13	484
	Busofya ..	Nange ..	229	347	17	7	600
		Total ..	442	595	27	20	1,084

DEATHS (UNDER ONE YEAR)—KAHAMA DISTRICT.

Sultanate :	Kahama.	Usumbwa.	Ngogwa.	Ukamba	Mbogwe.	Uyogo.	Msalala.	Busangi.	Bulungwa.	Ungoni.	Bugamba.	Kahama Town- ship.	Com- bined.	
Map Number :	D. 1.	D. 2.	D. 3.	D. 4.	D. 5.	D. 6.	D. 7.	D. 8.	D. 9.	D. 10.	D. 11.	—	—	
Months.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
January ..	6	8	3	4	2	—	8	1	—	—	5	—	1	40
February ..	10	8	6	3	—	5	2	1	1	—	—	1	1	35
March ..	6	7	3	1	1	—	3	7	3	—	—	—	1	26
April ..	21	7	4	1	—	2	5	2	4	1	1	—	—	48
May ..	11	4	1	1	—	4	4	6	—	1	—	—	—	33
June ..	13	10	6	1	—	2	1	3	—	1	—	—	—	34
July ..	2	3	3	2	—	8	1	6	—	—	—	—	1	20
August ..	12	8	2	—	—	5	2	1	1	—	1	—	1	27
September ..	5	2	2	—	—	6	—	2	—	—	3	—	—	33
October ..	9	8	—	—	1	3	—	1	—	1	—	—	—	20
November ..	6	8	3	1	—	4	1	1	—	—	—	—	—	22
December ..	10	2	2	1	1	5	2	1	—	1	—	—	1	31
TOTAL ..	111	75	32	11	5	56	24	42	15	6	10	5	365	290

DEATHS (OVER ONE YEAR).

January ..	8	13	5	7	3	4	4	14	10	8	7	1	1	3	4	3	2	9	2	1	1	2	—	53	55
February ..	3	12	10	8	12	2	2	7	6	4	1	4	1	1	—	1	—	9	—	1	1	—	—	50	46
March ..	4	3	14	3	10	2	2	2	—	2	4	7	1	3	1	3	5	5	—	—	—	—	41	35	
April ..	9	13	16	6	12	6	4	6	15	8	10	7	2	1	7	3	4	9	1	4	2	—	83	74	
May ..	7	12	13	9	8	9	2	9	5	8	2	10	1	—	5	5	4	3	—	—	—	—	61	55	
June ..	8	10	9	6	4	7	5	4	4	6	2	4	2	1	3	2	4	4	—	—	—	—	46	48	
July ..	7	6	15	15	6	6	7	2	1	4	4	4	2	1	3	5	4	4	1	—	—	—	55	48	
August ..	10	4	12	20	13	10	—	7	2	3	4	4	2	1	7	2	1	1	6	—	—	—	58	63	
September ..	5	4	7	11	4	13	5	9	3	4	9	6	2	—	10	6	2	2	2	2	2	—	54	62	
October ..	12	9	9	7	12	12	3	5	1	4	6	13	7	5	1	2	3	3	9	—	—	3	68	56	
November ..	8	6	3	1	5	8	1	4	2	8	13	4	2	—	2	1	4	4	3	1	2	13	41	64	
December ..	6	6	16	4	7	9	4	6	4	5	14	14	1	3	3	4	1	1	3	—	—	3	56	56	
TOTAL	87	98	129	97	96	108	32	48	53	64	81	28	28	47	41	47	47	47	23	21	32	24	666	662	

BIRTHS IN THE KAHAMA DISTRICT.

Sultanate.	Kahama.	Usumbwa.	Ngogwa.	Ukamba.	Mbogwe.	Uyogo.	Msalala.	Busangi.	Bulungwa.	Ungoni.	Bugomba.	Kahama Town- ship.	Com- bined.	
Map Number :	D. 1.	D. 2.	D. 3.	D. 4.	D. 5.	D. 6.	D. 7.	D. 8.	D. 9.	D. 10.	D. 11.	—	—	
Months.	M.	M.	F.	M.	F.	M.	M.	F.	M.	F.	M.	F.	M.	F.
January ..	22	9	13	12	7	6	4	15	3	—	2	—	1	94
February ..	17	8	7	7	11	6	4	9	—	—	—	1	59	
March ..	16	12	9	6	6	15	11	6	3	—	—	1	67	
April ..	37	15	8	7	11	9	7	10	6	—	1	2	119	
May ..	23	11	5	7	10	3	2	12	8	—	2	—	81	
June ..	32	7	12	12	14	5	6	11	—	1	2	—	107	
July ..	34	7	11	13	8	7	6	10	7	2	—	1	103	
August ..	29	9	11	5	13	4	2	9	4	—	2	1	75	
September ..	37	9	10	10	4	8	7	16	3	2	2	2	109	
October ..	27	7	15	12	8	11	3	11	3	4	—	3	104	
November ..	39	3	2	17	12	9	11	8	7	1	1	2	107	
December ..	24	7	7	8	20	15	9	9	3	—	—	7	96	
TOTAL ..	337	104	110	116	127	75	58	70	47	24	12	12	1124	
											5		1119	

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STILL-BIRTHS.

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VI.—HOSPITALS AND DISPENSARIES.

Additions and alterations to the hospital accommodation in the Territory are detailed below :—

				Cases Treated.		
				1926.	1927.	1928.
In-patients .. .. .	..	..	..	26,620	28,808	32,794
Out-patients .. .. .	..	..	..	307,635	367,762	372,764
Total .. .. .	..	..	..	334,255	396,570	405,558

The above figures do not include cases of yaws and syphilis treated in the districts, those attended to at the Maternity and Child Welfare Clinics, the returns from small dispensaries in charge of African dispensers, an unknown number seen by the medical staffs attached to the Public Works Department and railway extension labour forces.

Total cases, In- and Out-patients, treated at Government Hospitals and Dispensaries ..	405,558
Total cases treated at the Maternity and Child Welfare Clinics	41,556
Yaws and Syphilis cases treated on tour in District by Government Staff	15,915
Other cases treated on tour in District by Government Staff	71,150
Yaws and Syphilis cases treated by Medical Missionaries supplied with Government drugs and equipment	25,606
Other cases treated by African Dispensers in independent charge	27,538
Total	587,323

The returns received of the work performed during the year at the tribal dispensaries show a total of 140,702 cases.

New buildings erected and improvements and repair to existing medical buildings during 1928.—The following summary of work and the expenditure incurred during the year have been supplied through the courtesy of the Director of Public Works :—

CENTRAL PROVINCE—				£
Indian and Native Hospital, Dodoma .. .. .	..	..	..	1,500
Central Lunatic Asylum, Dodoma .. .. .	..	..	..	2,763
Leper Prison, Dodoma .. .. .	..	..	..	2,050
Lymph Laboratory and Staff Quarters .. .. .	..	..	..	1,400
TANGA PROVINCE—				
Repairs to S.A.S. Quarters, improved sanitation to Government School, etc. .. .. .	..	..	..	350
Native Hospital, Handeni .. .. .	..	..	..	625
Quarters for S.A.S. Korogwe .. .. .	..	..	..	450
NORTHERN PROVINCE—				
Removal and extension to European and Native Hospital, etc. .. .. .	..	..	..	950
European Hospital, Nurses' Quarters additional to Native Hospital, etc., Moshi .. .. .	..	..	..	1,900
EASTERN PROVINCE—				
Fence for Infectious Diseases Hospital, Dar-es-Salaam .. .. .	..	..	..	426
New wards for Infectious Diseases Hospital, Dar-es-Salaam .. .. .	..	..	..	436
Repairs to European Hospital, Dar-es-Salaam .. .. .	..	..	..	588
Erection of high pressure steam disinfection, Dar-es-Salaam .. .. .	..	..	..	6
Repairs to Hospital, Bagamoyo .. .. .	..	..	..	145
Native Hospital and addition to, Kilosa .. .. .	..	..	..	1,750
New wards to Native Hospital, Morogoro, etc. .. .. .	..	..	..	344
Hospital Dispensary, Utete .. .. .	..	..	..	500
MAHENGE PROVINCE—				
Repairs to Native Hospital, etc. .. .. .	..	..	..	45
Native Hospital .. .. .	..	..	..	476
IRINGA PROVINCE—				
European Hospital and Nurses' Quarters .. .. .	..	..	..	756
Repairs to Hospital, Mwaya .. .. .	..	..	..	140

KIGOMA PROVINCE—							£
Hospital and Dispensary and Sub-Assistant Surgeon's	Quarters	..	..	..	..	..	250
Hospital and Dispensary and Sub-Assistant Surgeon's	Quarters, Kibondo	..	..	..	..	..	29
BUKOBÁ—							
Native Hospital, etc.	..	..	..	..	..	..	3,202
MWANZA PROVINCE—							
Repairs, etc., to Health Office	..	..	..	..	..	..	} 400
Furnishing Quarters to Sister and Health Visitor	..	..	..	..	..	..
Welfare Clinic, etc.	..	..	..	..	..	..
Native Hospital and Dispensary, Maswa	..	..	..	..	..	..	570
Reconditioning of Fort as Hospital, Ikoma	..	..	..	..	..	..	65
TABORA PROVINCE—							
Repairs to European Quarters	..	..	..	..	..	..	45
Hospital and Dispensary, Kahama	..	..	..	..	..	..	275
Quarters for Sister and Health Visitor, Nzega	..	..	..	..	..	..	215
Maternity and Child Welfare Centre, Nzega	..	..	..	..	..	..	136

VII.—PRISONS AND ASYLUMS.—REPORT ON THE HEALTH OF PRISONERS FOR 1928.

Name of Prison.	1 Number of prisoners in prison on 31.12.27	2 Number of prisoners committed to prison during 1928	3 Number of prisoners in prison on 31.12.28	4 Daily average number of prisoners, 1928.	5 Number admitted to prison sick bay during 1928.	6 Number admitted to Government hospitals, 1928.	7 Daily average on sick list.	8 Number of deaths of prisoners.	9			10	
									(a) Cause of death in each case.	(b) Period of detention in prison prior to date of death.	(a) Prisoners released on medical grounds.	(b) Cause of release in each case.	
Arusha	50	262	96	89.2	—	12	6.3	2	1. Lobar pneumonia .. 2. Malaria, S.T. (cerebral type) —	Y. — M. — D. 35 125	— —	— —	
Bagamoyo	13	50	9	10.7	—	10	0.3	—	1. Tuberculosis ..	—	—	—	
Biharamulo	—	41	—	10.0	—	5	0.4	1	1. Tuberculosis ..	—	—	—	
Bukoba	141	329	83	122.6	165	24	9.5	2	2. Epilepsy and pneumonia	—	—	—	
Dar-es-Salaam	181	638	207	188.3	293	199	6.6	5	1. Lobar pneumonia .. 2. Cellulitis and gangrene of scrotum and pleurisy 3. Hookworm and pulmonary tuberculosis	— — —	— — —	— — —	
Dodoma	108	119	121	119.9	14	166	16.6	9	1. Lobar pneumonia .. 2. Ankylostomiasis .. 3. Chronic pleurisy .. 4. Cardiac failure and debility 5. Pneumonia and gangrene of lung 6. Senility, chronic bronchitis and emphysema 7. " " " 8. Debility, cardiac, and leprosy, anaesthetic 9. " " "	— — — — — — — — —	— — — — — — — — —	— — — — — — — — —	
*Handeni	—	4	—	1.6	—	—	—	—			—	—	
Iringa ..	20	74	45	22.2	—	2	0.7	—			—	—	
Kahama	6	89	12	19.8	—	—	0.05	—			—	—	
Kasulo	—	8	2	2.7	—	—	—	—			—	—	

* Small station—further details are lacking.

[illegible]

* Small stations—further details are lacking.

REPORT ON THE HEALTH OF PRISONERS FOR 1928—continued.

Name of Prison.	11 System of confinement : Association Cells (A.C.), Single Cells (S.C.).	12 Cubic space available at night per prisoner taking average number of prisoners.	13 Floor space in square feet per prisoner taking average number of prisoners.	14 Labour on which prisoners are employed and hours of work.	15 Sanitary condition of prison.	16 Are all cells cemented ?	17 Prevailing diseases.	18 Rules as to diet and hours of meals. What variety is provided : green food ? meat ?
Arusha . .	A.C. . .	cu. ft. 500	sq. ft. 40	Wood-cutting, mending roads, sanitary work in gaol and water carrying. <i>Hours :</i> Weekdays, 6.30 a.m. to 4 p.m.; Saturdays, 6.30 a.m. to 12 noon and no work on Sundays. Break of one hour for meal each midday. Cutting grass, sanitation of police lines and prison. <i>Hours :</i> 6.30 a.m. to 12 noon; 1 p.m. to 4 p.m.	Excellent . .	Yes	Malaria, fever, bronchitis, tape- worm and ulcers	According to the Prison Ordinance.
Bagamoyo . .	A.C. . .	2,690	368	Good	Good	Yes	Nil	Cassava, potatoes, beans, lemons, sometimes fish, other times meat or beef. Daily meat and fish to long term Native prisoners and three times a week to Indians and Arabs. Three times a day : 6 a.m., 12 noon and 5.30 p.m.
Biharamulo . .	A.C. . .	593	558	Good	Good	Yes	Nil	Bananas, beans, cassava, and ground nuts. They are being supplied with a lump of ghee every day.
Bukoba . .	A.C. and S.C.	400	45	Good	Good	Yes	Respiratory and intestinal	According to Government Notice No. 171 of 1924.
Dar-es-Salaam	A.C. and S.C.	975	66	Varied light work, basket- and mat-making, etc. <i>Hours :</i> 6 a.m. to noon and 1 to 4 p.m. Stone breaking, tailoring, carpentry, mat-making, painting, wood-cutting, cleaning, cooking, washing, Quartermaster's stores, sanitation, labourers at M.O.H., Dockyard and P.W.D. <i>Hours :</i> From 6.30 a.m. to 12 noon and from 1 p.m. to 4.30 p.m.	Very much better than last year	Yes	Malaria and chest troubles; no epidemic occurred during the year	Thoroughly satisfactory. Scale is as laid down in Government Notice No. 171 of 1924. The great majority of prisoners gain in weight. Eighty different scales of diet are employed according to nationality of the prisoner and the length of his term of im- prisonment.

REPORT ON THE HEALTH OF PRISONERS FOR 1928—continued.

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Name of Prison.	11 System of confinement : Association Cells (A.C.), Single Cells (S.C.).	12 Cubic space available at night per prisoner taking average number of prisoners.	13 Floor space in square feet per prisoner taking average number of prisoners.	14 Labour on which prisoners are employed and hours of work.	15 Sanitary condition of prison.	16 Are all cells cemented ?	17 Prevailing diseases.	18 Rules as to diet and hours of meals. What variety is provided : green food? meat ?
Dodoma	.. A.C.	cu. ft. 447	sq. ft. 28	Brick-making, masonry, carpentry, lime burning, station and town improve- ments, prison sanitation, water carrying, wood- cutting, quarrying and cultivation	Good	Yes	Influenza, scurvy, conjunctivitis, taninia, bron- chitis, injuries, rheumatism	As per dietary scale laid down in Government Notice No. 171 of 1924. Meals, noon and 4.30 p.m.
Iringa ..	.. A.C.	790	65	Wood-cutting (for firewood), water carrying, gardening, repair of roads, general sani- tary work and station im- provements. Hours : 7 a.m. to 12 noon and 1 p.m. to 4 p.m.	Very good indeed	Yes	Bronchitis, con- stipation, minor c o m p l a i n t s generally	Rationed in accordance with the scale laid down in Government Notice No. 171 of 1924. Hours of Meals : 6 a.m., 12 noon and 5 p.m.
Kahama	.. A.C.	770	40	General unskilled labour	Good	—	Nil	According to the standard scale.
Kasulo ..	.. A.C.	1,287	760	Sanitary work, such as grass- cutting, collecting fire- wood for use in gaol and water carrying for gaol	Good	Yes	Nil	Local grain ground into meal with Native vegetables.
Kibondo ..	.. A.C.	387.63	39.83	Cleaning out the grass from Government premises. Hours : 7 a.m. to 12 noon and from 2 to 4 p.m.	Satisfactory. The floors of the cells are daily disin- fected and the walls are white- washed twice in a year.	Not ce- mented ; but the drains outside the cells are cemented.	Minor diseases, as headache, constipation, ulcers, etc.	Beans and sweet potatoes, cassava and millet.
Kigoma	.. A.C.	500	50	Agriculture, fire-wood splitting, water carrying. Hours : 7.15 a.m. to 12 noon and 1 p.m. to 4 p.m.	Good	Yes	Malaria, ankylos- tomiasis, minor r e s p i r a t o r y diseases, tape worm	Standard long term and short term diets in force. Midday meal at 12 noon ; evening meal at 5.15 p.m.

REPORT ON THE HEALTH OF PRISONERS FOR 1928—continued.

Name of Prison.	11 System of confinement : Association Cells (A.C.), Single Cells (S.C.).	12 Cubic space available at night per prisoner taking average number of prisoners.	13 Floor space in square feet per prisoner taking average number of prisoners.	14 Labour on which prisoners are employed and hours of work.	15 Sanitary condition of prison.	16 Are all cells cemented ?	17 Prevailing diseases.	18 Rules as to diet and hours of meals. What variety is provided ; green food ? meat ?
Kilosa ..	A.C.	cu. ft. 500	sq. ft. 30	Building, carrying wood and water. <i>Hours</i> : 6 a.m. to 12 noon and 1 p.m. to 5 p.m.	Good ..	Yes ..	Diarrhoea ..	Maize and beans, meat to long term prisoners, lemons, 6 a.m., 12 noon and 5 p.m.
Kilwa ..	A.C. and S.C.	1,250	1,403	Building the new police lines. <i>Hours of work</i> : eight	Satisfactory and good	Yes ..	None in particular	Millet, millet flour, fish, fresh, ghee and lime or mangoes. According to the Prison Ordinance No. 14 of 1921. <i>Hours of Meals</i> : 12 noon and 5 p.m.
Kondoa ..	A.C. and S.C.	549	54.9	Work on prison vegetable and food garden. Govern- ment station work. No heavy labour is involved	Good ..	Yes ..	Minor respiratory diseases and constipation	Green food, no meat, variety poor. Only short term prisoners are kept ; long terms go to Dodoma. 6 a.m. and 4 p.m.
Lindi ..	A.C.	58,800	1,400	Unskilled ; 7 a.m. to 12 noon and 1 p.m. to 4 p.m.	Good ..	Yes ..	Malaria and yaws	6 a.m., porridge ; noon, grain, vegetables and ghee ; 5 p.m., fish, grain and fruit.
Lushoto ..	A.C.	789.3	72	Prison garden, wood, water, building and assisting with the sanitation of the town- ship	Very good ..	Yes ..	Minor injuries, coughs and colds	12 noon and 5.30 p.m. Diet as per Regulations.
Mafia ..	A.C. and S.C.	832	74	Wood cutting, including roads, helping sanitation, water carrying and pump- ing. <i>Hours</i> : 6 a.m. to 12 noon and from 1 p.m. to 4 p.m. Saturdays : 6.30 a.m. to 12 noon. Sundays, no work	Good ..	Yes ..	Injuries and ulcers of various kinds	As per Prison Regulations ; 2 lb. mealie meal, 5 oz. beans, $\frac{1}{2}$ -oz. ghee, and $\frac{1}{4}$ -oz. of salt per day. Lemons twice a week when available. 12 noon and 5 p.m.
Mahenge ..	A.C.	932	400	Cultivating prison farm, cutting and carrying fire- wood, drawing water and cleaning up police lines. <i>Hours</i> : 6 a.m. to 12 noon, and from 1 p.m. to 4 p.m.	Satisfactory	No ; beaten lime and sand	Minor injuries, bronchitis and coryza ; diarrhoea, etc.	As laid down in the diet scale of prison. Meat and dry fish, green vegetables are supplied frequently during a week.

Name of Prison.	11 System of confinement: Association Cells (A.C.), Single Cells (S.C.)	12 Cubic space available at night per prisoner taking average number of prisoners.	13 Floor space in square feet per prisoner taking average number of prisoners.	14 Labour on which prisoners are employed and hours of work.	15 Sanitary condition of prison.	16 Are all cells cemented?	17 Prevailing diseases	18 Rules as to diet and hours of meals. What variety is provided: green food? meat?
Manyoni	.. A.C.	cu. ft. 387	sq. ft. 43	Cultivating, etc. <i>Hours:</i> 6 a.m. to 12 noon and 2 p.m. to 4 p.m.	Good	Yes	Nil	As Prison Ordinance, green spinach provided; 12 noon and 4 p.m.
Mbeya	.. A.C.	641	46	General labour, building work, brick-making, etc. <i>Hours:</i> 6 a.m. to 12 noon and 1 p.m. to 4 p.m.	Good	No	Pharyngitis, acute bronchitis, enteritis, minor external in- juries, etc.	Diet is provided in accord- ance with the scale as laid down in the Prison Ord- inance.
Mbulu	.. A.C.	367	30·14	Road repair, cultivation of prison garden, cutting wood for prison, etc. <i>Hours:</i> 7 a.m. to 12 noon and 1 p.m. to 4 p.m.	Very satis- factory	Floors were cemented before, but the cement has practically gone now	Nil	Meals twice a day, at 12 noon and 4.30 p.m. Maize, 2 lb. each, 5 oz. beans, $\frac{1}{4}$ -oz. salt, $\frac{1}{2}$ -oz. ghee. Cassava, sweet potatoes when avail- able in prison garden, 6 oz. of meat daily for long term prisoners.
Mikindani	.. A.C.	325	83	Beating the roads, opening drains and transporting fuel for township, water supply	Good	Yes	Malaria	Meals are served at noon and 5.30 p.m., according to the dietary scale. Mangoes and lemons are provided occasionally.
Mkalama	.. A.C.	1,044	67	General labour	Good	Yes	Malaria, bron- chitis, constipa- tion, colic, wounds and ulcers, etc.	Diet according to regulations.
Morogoro	.. A.C. and S.C.	382	37	Excavation of sand, lime and stone. Wood-cutting, tim- ber sawing, work on prison garden. Transporting of sand, lime and stone. Masonry, carpentry, tailor- ing and smith work, clean- ing and sanitation of prison and premises. <i>Hours:</i> 6 a.m. to 12 noon; 1 p.m. to 4 p.m. daily, except Saturday, 6.30 a.m. to 11.30 a.m.; Sunday, no work	Very good..	Yes	Coughs, digestive troubles, cuts and bruises, and bronchitis. Some cases of hook-worm disease, most of them imported. Few cases of tuberculosis. Few cases of imported chicken-pox and diarrhoea.	As laid down in Prison Ord- inance 14 of 1921 and revised scale in General Notice No. 117 and special diets as may be ordered by Medical Officer. Mealie meal (whole), beans, cassava, millet, ghee, salt, onions, fresh meat for all prisoners over six months, wild spinach collected daily and fruit in season from Government agricultural garden. Meals: 6 a.m. 12 noon and 5 p.m. daily.

Name of Prison.	11 System of confinement: Association Cells (A.C.), Single Cells (S.C.).	12 Cubic space available at night per prisoner taking average number of prisoners.	13 Floor space in square feet per prisoner taking average number of prisoners.	14 Labour on which prisoners are employed and hours of work.	15 Sanitary condition of prison.	16 Are all cells cemented?	17 Prevailing diseases.	18 Rules as to diet and hours of meals, What variety is provided: green food? meat?
Moshi ..	.. A.C.	cu. ft. 300	sq. ft. 30	Cleaning of police and prison grounds, chopping wood, cooking, repairing police and prison clothes, carpentry, cultivation of prison garden, building work on prison. <i>Hours</i> : 6.30 a.m. to 12 noon; 1 p.m. to 4 p.m. Manual. 6 a.m. to 12 noon; 1 p.m. to 4 p.m.	Very satis- factory	Yes	Malaria, bron- chitis, pneu- monia, dysen- tery, conjunc- tivitis and other minor ailments	Porridge at 6 a.m.; meals at 12 noon and 5.30 p.m. Meat, bananas and lemons or limes are provided regularly.
Musoma ..	.. A.C.	700	64	Manual. 6 a.m. to 12 noon; 1 p.m. to 4 p.m.	Good	Yes	Nil	According to Prison Ordi- nance.
Mwanza ..	.. A.C.	320	56	Skilled trades, carpentry, tailoring and mat-making and sanitary work and prison garden. <i>Hours</i> : 6.30 a.m. to 12 noon; 1 p.m. to 4 p.m.	Good	Yes	Chronic gon- orrhoea, yaws, diarrhoea and colic	Meat with bones, maize, whole, beans, potatoes or cassava, ghee, salt, and two lemons per week; three meals a day.
Namanyere ..	.. A.C.	253	25	Road repairing, town im- provement, building, grass cultivation and clearing. 6 a.m. to 12 noon; 1 p.m. to 4 p.m.	Very good	No; burnt bricks	Malaria, rheu- matism and syphilis	According to scale of rations in Government Notices Nos. 171 of 1924 and 1925 respectively.
Nzega ..	.. A.C.	414	35	Manual. 6 a.m. to 12 noon; 1 p.m. to 4 p.m.	Satisfactory.	—	Coughs and colds, injuries, ulcers, etc.	The diet given is as per prison ration scale.
Pangani ..	.. A.C.	400	38	Road repairs, wood-cutting, sea-wall repairs. 7 a.m. to 4 p.m., with an hour's rest at 12 noon to 1 p.m.	Clean	Yes	Nil	Three meals; short term prisoners get maize, beans, millet, salt and lemon. Long term prisoners get meat, fish, sugar cane, cassava, beans, maize and millet.
Shinyanga ..	.. A.C.	411	31	Road work, construction of buildings, carrying water and fuel. 6.30 a.m. to 12 noon and 1 p.m. to 4 p.m.	Good	Yes	Bronchitis, malaria, dysen- tery, etc.	The meals are served twice a day, at 12 noon and 5.30 p.m. Maize, flour, ghee, beans, salt and meat to long term prisoners.
Njombe Singida ..	.. A.C.	450	40	Collecting wood, drawing water, and general labour	Good	Yes	Nil	Millet, maize, ghee, beans, vegetables, etc. 12 noon and 5 p.m.
Songea ..	.. A.C.	686.84	68.68	General—water, roads, fire- wood. <i>Hours</i> : 6.30 a.m. to 12 noon and 1 p.m. to 4.30 p.m.	Excellent	Yes	Intestinal diseases and bronchitis	Scale as laid down in Govern- ment Notice No. 171 of 1924. 6 a.m., porridge; 12 noon, porridge and beans; and 5 p.m., ditto. Long term prisoners get meat in addition.

Name of Prison.	11 System of confinement: Association Cells (A.C.), Single Cells (S.C.).	12 Cubic space available at night per prisoner taking average number of prisoners.	13 Floor space in square feet per prisoner taking average number of prisoners.	14 Labour on which prisoners are employed and hours of work.	15 Sanitary condition of prison.	16 Are all cells cemented?	17 Prevailing diseases.	18 Rules as to diet and hours of meals. What variety is provided: green food? meat?
Tabora ..	.. A.C. and S.C.	cu. ft. 254	sq. ft. 24	Tailoring, masonry, tin- smithing, carpentry; lime and charcoal burning, stone breaking and quarry- ing. Fuel cutting, building and casual labour. 6.30 a.m. to 12 noon and 1 p.m. to 4 p.m.	Satisfactory	Yes	Coughs and colds, ulcers and minor injuries; con- junctivitis	6 a.m.: Maize meal and cassava; 12 noon: maize meal and beans; 6 p.m.: Maize meal and beans. Long term prisoners receive daily 6 oz. of meat, $\frac{1}{2}$ -oz. ghee, and $\frac{1}{4}$ -oz. salt.
Tanga ..	.. A.C. and S.C.	343	25	Tailoring, soap-making, lime burning, wood-cutting, general repairs, sanitation, station and town improve- ment. 6.30 a.m. to 12 noon and 1 p.m. to 4.30 p.m.	Good	Yes	Malaria, bron- chitis, constipa- tion, myalgia and minor injuries	Three meals per day., 6 a.m., 12 noon and 5.30 p.m. <i>Natives</i> : Lemons, four times a week and 6 oz. meat. <i>Europeans</i> : Vegetables daily and 12 oz. meat. As per Government scale laid down in Government Notice, European and Asiatic prisoners, three meals a day served at suitable hours, as per scale in Prison Ordinance.
Tukuyu ..	.. A.C. and S.C.	458	94	Public works, alteration to prison, wood carrying, etc. 6.30 a.m. to 12 noon and 1.30 p.m. to 4.30 p.m.	Satisfactory	No	Nothing special ..	Mealies, beans, salt, bananas, sweet potatoes and ghee. Long term prisoners, plus $\frac{1}{2}$ -lb. of meat three times weekly. Midday and 5 p.m. Two principal meals: one at 10 a.m. and the other at 5 p.m. Millet, flour, porridge, beans, meat, dried fish and lemons.
Tunduru ..	.. A.C.	2,500	160	General station work. 6 a.m. to 12 noon and 2 p.m. to 4 p.m.	Satisfactory	No	Bronchitis, con- stipation, head- ache, wounds by cut and fall, etc.	Twice a day, 12 noon and 5 p.m. Mealie meal, beans, rice, meat and limes. Cas- sava for long term prisoners.
Utete ..	.. A.C.	570	55	Town and station improve- ments, road making, police latrines, and bath room buildings, whitewashing of police and prison build- ings, wood-cutting and bush clearing. From 7 a.m. to 12 noon and from 2 p.m. to 4 p.m.	Very good	Yes	Fever (presum- ably malaria), diarrhoea, con- stipation, bron- chitis, etc.	Twice a day, 12 noon and 5 p.m. Mealie meal, beans, rice, meat and limes. Cas- sava for long term prisoners.

Name of Prison.	19. Vaccinations.					20. Infective diseases. ¹			
	Number during 1928.			Number excused vaccination on account of previous smallpox or successful recent vaccination.	Number not protected against smallpox.	Number of cases of			Others.
	Vaccinated	Successful.	Modified.	Failures.		Chicken-pox.	Dysentery.	Influenza.	
Arusha	174	110	—	64	—	17	1	23	1 ringworm and 1 leprosy.
Bagamoyo ..	Nil	—	—	—	—	—	—	—	—
Biharamulo ..	Nil	—	—	—	—	—	—	—	—
Bukoba ..	Nil	—	—	—	—	—	—	—	—
Dar-es-Salaam ..	Nil	—	—	—	—	—	—	—	Pulmonary tuberculosis, 3. These are the only cases notified in 1928. Many non-notifiable infectious diseases (especially malaria) also occurred in the course of the year.
Dodoma ..	118	—	—	—	—	1	—	—	—
Iringa ..	41	—	—	—	—	—	—	—	—
Kahama ..	Nil	—	—	—	—	—	—	—	—
Kasulo ..	Nil	—	—	—	—	—	—	—	—
Kibondo ..	When considered necessary, the prisoners are vaccinated	—	—	—	—	—	—	—	—
Kigoma ..	All prisoners were vaccinated during the year	—	—	—	—	1	—	—	—
Kilosa ..	Nil	—	—	—	—	—	—	—	—
Kilwa ..	All prisoners were already vaccinated, so no vaccination required, as all are protected	—	—	—	—	—	—	—	—
Kondoa ..	A number have been vaccinated, but no record has been kept, other than the ordinary registers of vaccination, which do not differentiate prisoners from general population	—	—	—	—	3	—	—	—

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Name of Prison.	19. Vaccinations.					20. Infective diseases.				
	Number during 1928.					Number excused vaccination on account of previous smallpox or successful recent vaccination.	Number not protected against small-pox.	Number of cases of		
	Vaccinated.	Successful.	Modified.	Failures.	Chicken-pox.			Dysentery.	Influenza.	Others.
Lindi ..	Vaccinated on admission ..	—	—	—	—	—	—	—	—	1 nerve leprosy.
Lushoto ..	Nil	—	—	—	—	—	—	1	—	—
Mafia ..	All found vaccinated on admission	—	—	—	—	—	—	—	—	—
Mahenge ..	All prisoners who are not immunised by a previous attack of smallpox are vaccinated before certifying them as fit to work	—	—	—	—	—	—	—	—	—
Manyoni ..	Nil	—	—	—	—	—	—	—	—	—
Mbeya ..	Nil	—	—	—	—	—	—	—	—	—
Mbulu ..	Nil	—	—	—	—	—	—	—	—	—
Mikindani ..	Nil	—	—	—	—	—	—	—	—	—
Mkalama ..	Nil	—	—	—	—	—	—	—	—	—
Morogoro ..	No record	—	—	—	—	—	2	4 with one death	—	Tuberculosis, 5, with 3 deaths; Hookworm, 3, and 2 deaths, and not serious diarrhoea.
Moshi ..	Nil	—	—	—	—	—	—	6 cases, no deaths	—	—
Musoma ..	Nil	—	—	—	—	—	—	—	—	—
Mwanza ..	102	97	—	5	—	—	—	—	—	—
Namanyere ..	31	8	9	14	5	—	25	—	—	—
Nzega ..	Nil	—	—	—	—	—	—	1	—	—
Pangani ..	Nil	—	—	—	—	—	—	—	—	—
Shinyanga ..	42	24	—	18	—	—	—	—	—	—
Singida ..	Nil	—	—	—	—	—	—	—	—	—
Songea ..	Nil	—	—	—	—	—	—	—	—	—
Tabora ..	100	62	14	24	289	—	12	—	—	—
Tanga ..	Nil	—	—	—	617	—	—	—	20	—
Tukuyu ..	No record of any this year ..	—	—	—	—	—	No outbreak	No outbreak	No outbreak	No outbreak.
Tunduru ..	Nil	—	—	—	—	—	—	—	—	—
Utete ..	All vaccinated once during the year	—	—	—	—	—	—	—	—	—

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21. Insects and other Pests in Prison.						
Name of Prison.	Lice.	Bugs.	Fleas.	<i>Ornithodoros moubata.</i>	Rats.	Mice.
Arusha ..	—	—	—	—	—	—
Bagamoyo ..	—	—	—	—	—	—
Biharamulo ..	—	—	—	—	—	—
Bukoba ..	—	—	—	—	—	—
Dar-es-Salaam ..	There is very little trouble from these	—	—	—	—	—
Dodoma ..	—	—	—	—	—	—
Iringa ..	—	—	—	—	—	—
Kahama ..	—	—	—	—	—	—
Kasulo ..	Yes ; ticks have been seen. The floor is recemented	—	—	—	—	—
Kibondo ..	Rats, bed bugs, etc., are occasionally found in the prison, and every time sanitary measures are taken to avoid such nuisances. On occasions lice, bugs, and fleas are found from newly-admitted prisoners. The usual precautions of daily washings of the person, clothing, cells, etc., are carried out and the shaving of the head. Tar and whitewash are continually in use in the cells. Mosquitoes only.	—	—	—	—	—
Kigoma ..						
Kilosa ..						
Kilwa ..						
Kondoa ..	Sometimes bugs are found and these are destroyed with disinfectants, etc., such as kerosene ; and all the crevices and holes in the wall filled in and well cemented. All bedding put out daily in the sun.	—	—	—	—	—
Lindi ..	Nil. Rats occur, traps and barium carbonate are used.	—	—	—	—	—
Lushoto ..	None. Rats.	—	—	—	—	—
Mafia ..	—	—	—	—	—	—
Mahenge ..	—	—	—	—	—	—
Manyoni ..	—	—	—	—	—	—
Mbeya ..	—	—	—	—	—	—
Mbulu ..	A few rats which are caught by traps.	—	—	—	—	—
Mikindani ..	—	—	—	—	—	—
Mkalama ..	—	—	—	—	—	—
Morogoro ..	Rats sometimes come in from outside ; trapped or poisoned, or killed by cat.	—	—	—	—	—
Moshi ..	Rats and mice are present. Rat traps and poison are provided.	—	—	—	—	—
Musoma ..	—	—	—	—	—	—
Mwanza ..	—	—	—	—	—	—
Namanyere ..	—	—	—	—	—	—
Nzega ..	—	—	—	—	—	—
Pangani ..	—	—	—	—	—	—
Shinyanga ..	There are rats in the prison, and have been trapped by nippers.	—	—	—	—	—
Singida ..	—	—	—	—	—	—
Songea ..	Nothing in gaol.	—	—	—	—	—
Tabora ..	—	—	—	—	—	—
Tanga ..	There are no evidence of lice, bugs or mice. Rats were found during the year. These were cleared with traps and rat virus.	—	—	—	—	—
Tukuyu ..	—	—	—	—	—	—
Tunduru ..	—	—	—	—	—	—
Utete ..	Not at all, as the stone prison is recently built.	—	—	—	—	—

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22. Suggestions by the Medical Officer in charge as to improvements required and date when made.				
Name of Prison.	(a) Accommodation and Ventilation.	(b) Diet.	(c) Sanitation.	(d) Others.
Arusha ..	None	—	—	—
Bagamoyo ..	Nil	—	—	—
Biharamulo ..	Nil	—	—	—
Bukoba ..	—	—	—	—
Dar-es-Salaam ..	Nil	—	—	—
Dodoma ..	Improved ventilation, cementing of kitchen	Increased ration of antiscorbutics, collection and issue of Native spinach when available	Improvement to drainage ..	Suitable work to be given to criminal lepers.
Iringa ..	Re-cementing of floors ..	—	—	—
Kahama ..	Nil	—	—	—
Kasulo ..	Nil	—	—	—
Kibondo ..	No improvement is required at present, except that the floors of the cells be cemented	—	—	—
Kigoma ..	Repairs to roofs ..	—	Minor points of hygiene in the kitchen	—
Kilosa ..	Nil	Increase fruit supply	Construct new latrine, provide cover and disinfectant for ward bucket	—
Kilwa ..	Nil	—	—	—
Kondoa ..	Nil	—	Verbal suggestions on inspection parades daily	—
Lindi ..	None	—	—	—
Lushoto ..	None	—	Latrine improvements suggested in 1926	—
Mafia ..	Nil	—	—	—
Mahenge ..	None	—	—	—

REPORT ON THE HEALTH OF PRISONERS FOR 1928—continued.

Name of Prison.	22. Suggestions by the Medical Officer in charge as to improvements required and date when made.			
	(a) Accommodation and Ventilation.	(b) Diet.	(c) Sanitation.	(d) Others.
Manyoni ..	None	—	—	—
Mbeya ..	Nil	—	—	—
Mbulu ..	Nil	—	—	—
Mikindani ..	Nil	—	Provision of separate latrine outside	—
Mkalama..	Nil	—	—	—
Morogoro ..	Nil	—	—	—
Moshi ..	Nil	—	—	—
Musoma ..	Nil	—	—	—
Mwanza ..	Nil	—	—	Only verbal suggestions ; no orders.
Namanyere ..	Nil	—	—	—
Nzega ..	Nil	—	—	—
Pangani ..	Nil	—	—	—
Shinyanga ..	Nil	Provision of germinated beans ..	—	—
Singida ..	Nil	—	—	—
Songea ..	Nil	—	Proper surface drainage to be installed in Prison yard	—
Tabora ..	Nil	—	—	—
Tanga ..	Nil	—	—	—
Tukuyu ..	Nil	—	—	—
Tunduru ..	Nil	—	—	—
Utete ..	Nil	—	—	—

23. Action taken by the Prison Authorities as a result of 22.

Name of Prison.	(a)	(b)	(c)	(d)
Arusha ..	N.a.	—	—	—
Bagamoyo ..	N.a.	—	—	—
Biharamulo ..	N.a.	—	—	—
Bukoba ..	In every case, with the single exception of bathing accommodation within the gaol, suitable action has been taken, monies have been asked for to carry out our suggestion with reference to ventilation, latrines have been built and the sick made more comfortable	—	—	—
Dar-es-Salaam ..	N.a.	—	—	—
Dodoma ..	Carried out	—	—	—
Iringa ..	Reporting to the Commissioner of Police and Prisons	—	—	—
Kahama ..	N.a.	—	—	—
Kasulo ..	N.a.	—	—	—
Kibondo ..	N.a.	—	—	—
Kigoma ..	Repaired	—	Attended to	—
Kilosa ..	N.a.	Done	Done	—
Kilwa ..	Whatever little and minor things suggested, all were carried out immediately	—	—	—
Kondoa ..	N.a.	—	Carried out	—
Lindi ..	N.a.	—	—	—
Lushoto ..	N.a.	—	Improvements are now in hand and new latrines are nearing completion	—
Mafia ..	N.a.	—	—	—

REPORT ON THE HEALTH OF PRISONERS FOR 1928—continued.

Name of Prison.	23. Action taken by the Prison Authorities as a result of 22.			
	(a)	(b)	(c)	(d)
Mahenge ..	N.a.	—	—	—
Manyoni ..	N.a.	—	—	—
Mbeya ..	N.a.	—	—	—
Mbulu ..	N.a.	—	—	—
Mikindani ..	N.a.	—	Carried out	—
Mkalama ..	N.a.	—	—	—
Morogoro ..	N.a.	—	—	—
Moshi ..	N.a.	—	—	—
Musoma ..	N.a.	—	—	—
Mwanza ..	Renovation of cells	N.a.	—	Carried out.
Namanycere ..	N.a.	—	—	—
Nzega ..	N.a.	—	—	—
Pangani ..	N.a.	—	—	—
Shinyanga ..	N.a.	Carried out	—	—
Singida ..	N.a.	—	—	—
Songea ..	N.a.	—	Temporary arrangements have been made by the Officer in charge	N.a.
Tabora ..	N.a.	—	—	—
Tanga ..	N.a.	—	—	—
Tukuyu ..	N.a.	—	—	—
Tunduru ..	N.a.	—	—	—
Utete ...	N.a.	—	—	—

Name of Prison.	24 What sanitary arrangements are there in the cells for use at night ?	25 Is drinking water provided for use at night ?	26 Is there a weight register and is it kept up to date ?	27 What number of blankets is provided for each prisoner ?	28 Is the clothing sufficient ?	29 Further remarks and suggestions.
Arusha ..	Sanitary buckets, etc.	Yes	Yes	One in warm weather; two in cold weather; waistcoats and coir sleeping mats are also provided	Yes	The prison was improved during the year. A new corrugated iron roof was erected over cells and stores. A cell and bath room were built for European prisoners with a corrugated iron roof, a wooden ceiling and cement floors. All cells were lime-washed and the lower half of the walls painted with coal-tar. All wooden doors and window-frames were painted with solignum.
Bagamoyo ..	One latrine bucket per cell is provided	Yes	Yes	One per head	Yes	A proper soakage pit for the water from the gaol buildings should be built.
Biharamulo ..	Buckets	Yes	Yes	One blanket ..	One suit of clothes has been supplied to each	Nil
Bukoba ..	Bucket	Yes	Yes	One blanket; two have been recommended	Yes	Nil
Dar-es-Salaam ..	Prisoners have access to water-flushed latrines	Yes	Yes	One mat and one blanket for healthy prisoners. One mat and two blankets for sick prisoners	Yes	Nil
Dodoma ..	Pans and urinal pails placed in cells at night	Yes	Yes	Sleeping mat and two blankets	Yes; two suits per prisoner	Nil
Iringa ..	Night-soil buckets in each cell; these are removed each morning	Yes	Yes	Two	Yes	General sanitary condition of the gaol and the care of prisoners is in every way very satisfactory. No cases of serious sickness have occurred during the year.
Kahama ..	Buckets are supplied	Yes	No weight register kept	One	Yes	Nil
Kasulo ..	Buckets	Yes	—	One	Yes	Nil
Kibondo ..	Buckets	Yes	—	One	Yes	Nil
Kigoma ..	Latrine buckets ..	Yes	Yes	One	Yes	Nil
Kilosa ..	Latrine pans ..	Yes	Yes	One	Yes	Nil
Kilwa ..	There are all sanitary arrangements in the cells for use at night	Yes	Yes	One blanket and one sleeping mat have been supplied for each	Yes	Nil
Kondoa ..	Urine drums ..	Yes	There is no weight register	One	Yes	Nil
Lindi ..	Buckets	Yes	Yes	One blanket in the hot season and two in the cool	Yes	Nil

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Name of Prison.	24	25	26	27	28	29
	What sanitary arrangements are there in the cells for use at night ?	Is drinking water provided for use at night ?	Is there a weight register and is it kept up to date ?	What number of blankets is provided for each prisoner ?	Is the clothing sufficient ?	Further remarks and suggestions.
Lushoto ..	Latrine pan in each cell	Yes	Yes	Two ..	Yes ..	None.
Mafia ..	Sanitary buckets ..	Yes	No ..	One blanket and one sleeping mat	Yes ..	Nil
Mahenge ..	Each cell is provided with a latrine pan	Yes	Yes	Two ..	Yes ..	Nil
Manyoni ..	Latrine pans are provided	Yes	No ..	One ..	Yes ..	Nil
Mbeya ..	Sanitary buckets are provided in the cells for use at night	Yes	No ..	Two blankets and a sleeping mat	Yes ..	Nil
Mbulu ..	A Native latrine pan is kept for use in the cell at night	Yes	No weight register kept	One to cover and one mat for sleeping	No ..	(1) There is no latrine provided inside the gaol, which may be done, and if this is not possible, number of latrine pans should be increased to nearly half the average number of inhabitants ; (2) The floor of the cells should have early alteration, as the old cemented floor is somewhat damaged ; (3) One more blanket should be provided for use in the night time, as the place is very cold. There is a very small prison, and only a few prisoners can be accommodated ; It is suggested that the water pipe be laid inside the gaol, as the water pipe is passing quite in front of the door and it will be very useful to save the time of prisoners, who waste much time in bringing the water from a far-off place.
Mikindani ..	One sanitary bucket is provided to each cell for the prisoners	Yes	No ; only the long term prisoners are weighed	One good blanket (coastal station)	Yes ..	Nil
Mkalama..	Sanitary buckets ..	Yes	—	One blanket	Yes ..	Nil
Morogoro ..	Sanitary bucket provided	Yes	Yes	One and a mat ; more when ordered by Medical Officer	Yes ..	Nil
Moshi ..	Two buckets for each cell	Yes	Yes	One blanket and a mat	Yes ..	Nil
Musoma ..	One bucket for urine and another for faeces in each cell	Yes	Yes	One blanket	Yes ..	As the Medical Officer pointed out last year but one, it is essential that a prison hospital be constructed inside the gaol. The absence of small wards is or may be, in the event of an infective disorder breaking out, a serious matter, and at least two small wards should be built to accommodate sick prisoners.

Name of Prison	24 What sanitary arrangements are there in the cells for use at night ?	25 Is drinking water provided for use at night ?	26 Is there a weight register and is it kept up to date ?	27 What number of blankets is provided for each prisoner ?	28 Is the clothing sufficient ?	29 Further remarks and suggestions.
Mwanza ..	Sanitary buckets ..	Yes ..	Yes ; every prisoner weighed ..	One blanket ..	Yes ..	Nil
Namanyere ..	Two sanitary buckets ..	Yes ..	Yes ..	Two blankets ..	Yes ..	Nil
Nzega ..	Sanitary buckets ..	Yes ..	— ..	One blanket and a coir rope mattress are supplied to each prisoner ..	Yes ..	Nil
Pangani ..	Pans ..	Yes ..	Yes ..	One ..	Yes ..	Nil
Shinyanga ..	Latrine pans and urine drums are placed in the wards at night ..	Yes ..	Yes ..	Two blankets and one mattress of coir rope are provided to each prisoner ..	Yes ..	Nil
Singida ..	Drums provided ..	Yes ..	Yes ..	Two ..	Yes ..	Prisoners should be provided with mats to lie on.
Songea ..	Urine drums with lids in cells at night ..	Yes ..	Yes ..	Two blankets and one mat ..	—	Nil
Tabora ..	One latrine bucket per cell ..	Yes ..	Yes ..	One blanket, one mat and a blanket jacket ..	—	Nil
Tanga ..	Urine pails and one other sanitary pail are placed in each cell at night ..	Yes ..	Yes ..	One blanket and one sleeping mat ; and two blankets for old-age prisoners ..	—	Nil
Tukuyu ..	Buckets ..	Yes ..	Yes ..	Three and sleeping mat. No fire in cells ..	—	The prison is undergoing alterations under the new scheme for separating men, women and remand prisoners.
Tunduru ..	A bucket is provided for night soil and urine ..	Yes ..	Yes ..	Each prisoner is supplied with one blanket during hot weather, and two during the cold weather ..	—	Nil
Utete ..	Latrine pans are placed at 6 p.m. for use at night ..	Yes ..	Yes ..	One blanket and one rope-mat ..	—	Nil

MENTAL HOSPITALS.

I.—DODOMA MENTAL HOSPITAL.

<i>Numbers—</i>				Males.	Females.	Total.
In residence on 1.4.28	..	..	..	—	9	9
Admitted since 1.4.28	..	..	..	59	12	71
Discharged since 1.4.28	..	..	..	4	2	6
Died since 1.4.28	..	..	..	15	2	17
Remaining on 31.12.28	..	..	..	40	17	57

Admissions (80)—

31	Patients	suffered from	mania in its various forms.
6	“	“	imbecility with epilepsy.
5	“	“	depressive insanity.
2	“	“	idiocy.
1	“	“	suspected G.P.I.
22	“	“	imbecility.
13	“	“	delusional insanity.

Discharges (6)—

3	Patients	were discharged	as recovered.
3	“	“	improved.

Deaths (17)—

The principal causes of death appeared to be as follows :—

2	females.	Exhaustion and cardiac failure following diarrhœa.
2	males.	Exhaustion following successive epileptic seizures.
4	“	Intestinal complications.
3	“	Dysentery.
2	“	Pneumonia.
1	“	Exhaustion following prolonged excitement and restlessness.
1	“	Hypostatic pneumonia.
1	“	Cardiac failure.
1	“	(?) General paralysis of the insane.

Health.—The general health has been satisfactory. There has been no epidemic and no serious casualty has occurred throughout the year.

Three patients were secluded for a total period of 18 hours ; in no case did seclusion last longer than four hours.

Artificial restraint has not yet been employed at this hospital.

The staff have carried out their duties satisfactorily, no case of ill-treatment has been observed, and no complaint of such has been made by a patient.

Work.—Fifty per cent. of the patients have been employed in occupations congenial to themselves and of value to the institution.

Much spade work remains to be done in clearing grounds and planting shrubs and seeds. The supply of sisal from Headquarters has been appreciated ; even the most violent patients will occasionally lend a hand to make ropes and string.

Visitors.—The hospital has been visited by the following :—

	Number of visits.
His Excellency The Governor	1
The Honourable The D.M.S.S.	1
His Honour The Chief Justice	1
Parliamentary Commission	1
Provincial Commissioner, Central Province, Dodoma	17
Medical Officer, Dodoma	38
District Officer, Dodoma	7

Improvements.—The present buildings have been recently completed. Two day rooms, one for each sex, are necessary ; they would be used as dining-rooms, which do not exist at present.

The accommodation consists mainly of single rooms which should contain one patient per room, so that when three more females are admitted the ward will be full.

The male wards have a few more vacancies, but dormitories (one for each sex) to contain 20 beds, will be necessary in the immediate future.

General.—The following Departments have assisted the hospital in every possible manner :—

Police and prisons, supplies of water and wood.

Agriculture, supplies of plants, seeds, and a weekly gift of fruit.

Education, gifts of footballs, which have been greatly appreciated, and which have amused all classes of patients.

The hospital is further indebted to the following :—

The Provincial Commissioner, Central Province.

The Medical Officer, Dodoma.

The District Officer, Dodoma.

Apart from official visits, the Board of Visitors have displayed an interest in the progress of the hospital and the welfare of the inmates, which has been greatly appreciated.

Ample supplies of medical stores were received from Headquarters.

II.—LUTINDI MENTAL HOSPITAL.

Statistics—

	Males.	Females.	Total.
In residence on the 1st January, 1928 ..	47	34	81
Admitted during the year 1928	8	3	11
Discharged during the year 1928 ..	4	1	5
Deaths during the year 1928	3	5	8
Remaining on the 31st December, 1928 ..	48	31	79
Average daily number resident, 1928 ..	48	32	80
Total under treatment during 1928 ..	55	37	92

	yrs.	mths.	yrs.	mths.	yrs.	mths.
Average stay of those discharged ..	2	1	1	4	1	1
" " who died	3	10	1	8	2	6
" " remaining.. ..	6	1	10	6	8	4

Admissions.—The number of patients admitted throughout the year were 11. The majority of those admitted were very run down and suffering from great debility. Their mental condition was classified as follows :—

4	suffered from mania in various forms.
2	" dementia.
1	" hemiplegia with mental enfeeblement.
2	" melancholia.
1	" delusional insanity.
1	" imbecility.

Two men were admitted for the third time (mania cases).

One woman was admitted for the second time (mania case).

Discharges.—The number of patients discharged were five; four of the patients discharged suffered from mania. As no signs of insanity had been noticed with all four during the last months of their stay they were considered cured. One case of epilepsy was sent to the hospital at Lushoto for treatment.

Deaths.—Three males and five females died during the year. The principal cause so far as could be ascertained in each case was as follows :—

1 Cerebral seizure.	2 Paralysis.
2 Phthisis.	1 Intestinal disease.
1 Pleurisy.	1 Apoplexy.

Two women suffering from progressive paralysis taxed the attention of the nursing staff to the utmost. Both were very ill for months before they died.

Health.—The general health has been very good. There have been no cases of dysentery. At the beginning of the year there was a heavy influenza epidemic in the district, which also affected the inmates of the asylum. At times we had as many as 32 patients down with influenza. No death occurred.

Ten patients (3 men and 7 women) had to be isolated from time to time for a short period during the day, so that they were prevented from injuring themselves or other patients during their fits of insanity. (Total, 123 hours.)

Handcuffs were not needed during the past year ; 5 patients hurt themselves during their epileptical fits ; 7 patients injured themselves during their mad fits ; 8 patients injured their fellow-patients by biting, scratching or beating, but, I am glad to say, nothing serious.

New patients, especially those from the plains or the coast, who were admitted in a very nervous and excited state, settled down very quickly. The main reason for this I consider to be the high altitude and the healthy climate of Lutindi.

Occupation of the Patients.—Work and occupation is for most of our patients a cure in itself, and the mere fact of keeping them busy is a most effective means of helping them over their mental debility.

It is a pleasure to see how most of the patients occupy themselves. In some cases a good deal of persuasion is required to convince a patient to leave off work if his constitution is in need of rest. I have the impression that our patients, even the weakest of them, feel that when working they are still of some use to mankind and not absolutely cut off from all associations with the outside world, and, therefore, I always try my best to give them, even the weakest, some suitable occupation.

Patients who are suffering from ill-health or disease are, of course, free from all work ; all the others are suitably employed indoors or outside.

Approximately 24 patients (male) were sent daily under the supervision of their warders to do outside work ; they either helped in the field with planting, uprooting and harvesting the crop, picking coffee in the coffee season, or they were cleaning the roads, cutting and bringing in the firewood, and it was really astonishing to watch and notice the skill with which most of them settled down to work and handled their different jobs.

Sanitation.—A new water supply has been laid on, pipes put down, which bring fresh water from the forest to the station, where the patients can get as much as they require from five different taps.

All the rooms of both the asylums were painted inside and outside four times during the past year ; in some cells the cement floors were renewed. Both the compounds close to the asylums were covered with clay soil and properly beaten down. The rooms are cleaned daily, and every Saturday they are washed down with a solution of Lysol and water ; also the beds. Both the compounds are flooded once a week.

A cesspool, 6 m. deep, 4 m. long and 3 m. wide, has been dug about 50 m. away from the wards ; the latrines are cleaned by a flow of water which carries everything through cement pipes into this pit.

Inspections.—The Administrative Officer in charge of the Usambara District inspected the asylum on the 23rd July, 1928.

The Medical Officer, Lushoto, inspected the asylum on the 23rd July, 1928, and on the 6th December, 1928.

The Assistant District Officer, Korogwe, inspected the asylum on the 2nd July, 1928, and on the 11th December, 1928.

During the current year 5,567 outside patients received medical treatment at the Lutindi out-patient dispensary, some coming from long distances. Many of the out-patients suffered from hookworm.

VIII.—RAINFALL.

TOTAL RAINFALL IN MILLIMETRES BY STATIONS, 1928.

Districts.	Stations.							Feet above sea- level.	Rainfall in millimetres.
CENTRAL LINE AREA :									
Dar-es-Salaam	Dar-es-Salaam	S.L.	978·0						
Morogoro	Morogoro	1,628	726·2						
	Kilosa	1,606	1,065·6						
Dodoma	Dodoma	3,693	383·5						
	Manyoni	4,135	599·3						
	Singida	5,233	630·4						
	Mpwapwa	3,000	502·2						
Tabora	Tabora	4,000	971·2						
	Kahama	4,055	715·3						
	Nzega	—	837·6						
Kigoma	Kigoma	2,531	660·0						
	Kasulo	4,530	1,021·5						
	Kibondo	4,981	1,055·6						
COASTAL AREA, SOUTH :									
Lindi	Lindi	S.L.	994·4						
	Tunduru	2,300	854·2						
	Masasi	1,505	832·3						
	Mikindani	S.L.	752·4						
Mafia Island	Kilidoni	63	2,099·5						
Kilwa	Kilwa	S.L.	741·9						
	Liwale	1,500	865·5						
	Kibata	1,700	716·0						
Rufiji	Utete	327	732·7						
COASTAL AREA, NORTH :									
Pangani	Pangani	S.L.	1,131·8						
Tanga	Amani	3,004	2,320·7						
NORTHERN HINTERLAND :									
Moshi	Moshi	2,649	1,204·1						
Arusha	Arusha	4,416	982·9						
	Mbulu	5,900	977·4						
Mwanza	Mwanza	3,709	868·9						
	Musoma	3,709	567·6						
Bukoba	Bukoba	3,709	2,241·7						
	Biharamulo	4,350	765·4						
Usambara	Lushoto	4,579	1,570·7						
Kondoa-Irangi	Kondoa-Irangi	4,610	378·7						
	Mkalama	4,235	701·2						
SOUTHERN HINTERLAND :									
Songea	Songea	3,826	1,291·9						
	Milo	8,300	—						
Iringa	Iringa	5,365	716·0						
	Njombe	—	1,217·5						
Rungwe	Tukuyu	5,069	2,941·1						
Mbeya	Mbeya	—	808·3						
Ufipa	Namanyere	5,100	---						

IX.—SCIENTIFIC.

A REPORT ON HUMAN TRYPANOSOMIASIS IN TANGANYIKA TERRITORY FOR THE YEAR ENDING 31ST DECEMBER, 1928. BY DR. G. MACLEAN, M.B.E., M.B., CH.B. (GLAS.), D.T.M. (LIV.), SLEEPING SICKNESS OFFICER.

In last year's Annual Report mention was made of an outbreak in Northern Tabora and the possible danger of spread to Kahama, Kibondo and Biharamulo alluded to.

It was subsequently found that, actually at that time, the disease was spreading in the central part of Kahama District. This spread both in Northern Tabora and Kahama continued almost unabated during the year.

With this exception and an unimportant outbreak in Gongwe, a small scattered chieftdom in Ufipa, the position in the other areas might be regarded as satisfactory.

II.—CASES.

The following table shows the new cases and deaths recorded in the different Provinces during the year :—

Province—								New Cases.	Deaths.
Mwanza .. .. .	..	..	..	..	..	..	..	172	69
Tabora .. .. .	..	..	..	..	..	..	..	1,443	235
Kigoma—									
Tanganyika Lake Shore .. .. .	..	..	..	..	..	..	..	4	1
Ufipa .. .. .	..	..	..	..	..	..	..	101	59
Dodoma .. .. .	..	..	..	..	..	..	..	6	3
Lindi .. .. .	..	..	..	..	..	..	..	25	28
Total .. .. .	..	..	..	..	..	..	..	1,751	395

III.—POLICY.

The policy laid down in the last Annual Report is being continued and developed.

Where people are being resettled the Agricultural Department has assisted in selecting suitable sites, making recommendations for agricultural development, and supplying seeds to the Natives in some cases.

Mr. Richardson, District Agricultural Officer, has drawn up a scheme for rotation of crops in the new settlements and this scheme has already been put into practice in places.

Geological surveys and mining developments are being kept in touch with because of their bearing on future developments and therefore on the choice of sites for resettlement of people who have to be evacuated.

A point that will require increasing attention in the future, is the dissociation that is taking place between cultivation of land and stock raising. A man gives up cultivating in the open country, leaves his stock there, and goes and cultivates in the forest without any intention of ever bringing his stock there. This, according to the experts, is not good farming, and it is a custom that intensifies the problem of both human and animal trypanosomiasis in that it makes no provision against the encroachment of bush on the open country, or for consolidating or rendering safe what land is reclaimed within the forest.

IV.—ADMINISTRATION.

The International Commission has now made its recommendations for the control of sleeping sickness and it is necessary to enquire to what extent the principles they lay down and the methods they recommend can be applied to this Territory.

The first principle laid down is that "The movement of Natives ought to be controlled." With this principle most people, I imagine, will agree. It is a principle that has to be extended to non-Natives as well in certain areas and under certain circumstances.

To achieve this the methods recommended by the Commission are :—

(a) “ A census of all Natives.”

This is already in hand in the Territory and has been carried out very minutely, among other places, in Kahama and Northern Ufipa.

(b) “ The institution and employment of an identity book or card for each Native, in which can be included a medical passport, to which reference will be made later on.”

The question of an identity book or card has been under discussion in the Territory for years and its practicability is a matter for administrative experts to decide. If a decision is made in its favour it would be a simple matter to incorporate a medical passport.

Entries in such passports should not be made by any one under the rank of Sub-Assistant Surgeon, unless in exceptional circumstances, as there is obvious room for abuse, *e.g.*, a false entry of sleeping sickness, tuberculosis, etc., might wrongly exempt a man from tax for years.

These passports should only be filled in on occasions when the person came under medical treatment, and remarks as to cure or return for future inspection should be made. I do not think the medical passport should be used as a permit. I have frequently been struck with the success with which an efficient and sympathetic Native Authority can trace people missing from their areas, and I consider that they are the proper authority to visa an identity card or, in its absence, issue a pass. Instructions can be, and have been from time to time, issued to them to give no permission to sleeping sickness cases to leave their areas. Cases of doubt they can refer to the medical authorities. Specific regulations can be made under the Native Authorities Ordinance to meet local conditions.

The system in actual practice now in some parts of Tabora Province may be cited as an example. Cases of sleeping sickness who have been treated and have, apparently recovered are kept under observation for years.

These people are called up for medical inspection from time to time. Native authorities are usually able to trace absentees, and can generally tell where they are even when the people have gone to another tribal area. Should this occur, the matter is reported to the Administrative Officer concerned who has the absentees rounded up by the Native Authority into whose area they have moved. Native Authorities also appeal to Administrative Officers on their own initiative when people are leaving them for another tribal area without permission.

Making this use of Native Authorities does not imply that there is no need for identity cards. The Authorities can work effectively in their own areas, and through the Administration, in association with their immediate neighbours, but people who move beyond a certain radius they are apt to lose sight of, and for these there is, I think, no alternative to the identity card.

(c) “ Delimitation of areas, entry into and departure from which are contingent on the possession by the Native of a visa from the medical authorities stating that he is free from trypanosomiasis.”

Delimitation of areas is now in practice in such districts as it is considered necessary, the delimited area being the Native Authority area, and regulations are already in force, in places, to prevent permanent removal from one area to another.

In the case of people wishing to leave the area for a few months only I do not think any great benefit would accrue from medical visas unless we were prepared to go to considerable expense. To make it a genuine safeguard quarantine camps in fly-free areas would be necessary where people would remain at Government expense for a minimum period of 14 days, and this would have to be repeated every time they passed through an infected fly-belt. Discussion of this extreme measure can well be postponed till the practical value of the identity card is first ascertained.

(d) “ The formulation and promulgation of a law or laws giving force to all these regulations.”

I understand that an ordinance has already been drafted which will give force to any regulations that may be necessary.

With regard to giving magisterial powers to the medical authorities, this would be a new departure for this Territory and would involve some important issues. So far as my own experience goes, I have not seen any urgent need for these powers. Native Authorities, where they are competent and in sympathy with regulations, can deal with Native cases.

Medical Officers can, under the existing system, advise the Native Authorities and if that advice is not followed, the proper course to pursue is to negotiate with the Administrative Officer concerned, either directly or through his Head of Department.

(e) "An international agreement, between the Administrations of all countries in which human trypanosomiasis occurs, about the control of the disease on frontiers; an agreement similar to those adopted to control epidemic infectious diseases such as plague and smallpox."

The question is inseparable from the larger issue of international trade and social relations on the frontiers. At ports such as Kigoma, control is comparatively easy, and a system of passes is already in force. Where frontiers are little more than arbitrary lines with no effective natural barriers, the position is quite different, and a mere system of passes under any department is not enough without a perfect network of observation posts. Before considering quarantine measures for these frontiers the international attitude towards everyday intercourse must be clearly defined. Are trade and movements of people to be prohibited except through prescribed channels, and are permits to travel to be refused on other than medical grounds? If so, can these prohibitions, easy enough to formulate, be put into practice at a reasonable cost? The matter is an important and urgent one, and I submit that the questions raised should be inquired into by the Governments concerned before any elaborate sleeping sickness regulations are attempted. There is one more aspect of the situation to which it may be worth while directing attention, namely, that of intermarriage. In my experience, intermarriage is one of the most important factors in the spread of sleeping sickness and, if we are going to have prohibitions at all, the question of forbidding intermarriage between Natives of different territories will have to be carefully considered.

(f) "The establishment of observation-posts where the examination and control of visas can be carried out."

Anything that is done of this kind within the Territory at present should go hand in hand with the development of labour camps along the chief labour routes. I do not think anything need be added in the meantime to the recommendations made in last year's report.

The second principle laid down by the Commission is that "the census of infected Natives ought to be thorough and complete."

Records of the names and places of residence of all known cases of sleeping sickness are kept both in the infected districts and at the central office.

The third principle laid down is that "Natives infected with trypanosomiasis ought to be treated."

This is almost invariably done in all known cases, except when their condition is hopeless.

The fourth principle laid down is "the evacuation of heavily infected zones," but they recommend it only as an urgency measure.

Finally, the costliness of clearing measures is emphasized, and the importance of having such carried out under the control of trained entomologists.

It might be suggested that, in *G. morsitans* areas at least the advice of an agricultural expert is just as important.

The following system of control is in force in Tanganyika Territory :—

- (1) Treatment of all cases wherever practicable. At least 90 per cent. of all known cases received treatment.
- (2) Abolition of bush family villages and the aggregation of people into large settlements where land is suitable for development. Settlements with a population of a few hundred people are sometimes allowed, but wherever possible a minimum population of 3,000 to 4,000 is what is aimed at.
- (3) Prohibition of labour recruiting in the affected areas.
- (4) Control of the movements of Natives from one area to another through the Native Authorities.

When a Native belonging to one area moves without permission into another area, and so outside the jurisdiction of his own Native Authority, he is traced by the Native Authority into whose area he has moved, the channel of negotiation being the District Officers concerned.

The efficiency of this regulation varies considerably in different areas, but on the whole works better than direct control by the Medical Department could. It has the advantage of having a strong motive to support it. No Native Authority likes to lose its people if it can help it, as both tax and prestige are involved. Its chief weakness, as has already been pointed out, is that they are apt to lose trace of absentees after these have gone beyond a certain radius. If these can be traced at all effectively, some kind of identity form seems the only solution.

(5) Breaches of these regulations are dealt with, in the case of non-Natives, by Administrative Officers and Magistrates, and in the case of Natives, by the Native Courts.

When the medical staff find breaches of the regulation committed they refer the case to the appropriate court.

V.—RESEARCH.

What research is done is confined almost entirely to observations on epidemiology and treatment. Besides observations on Bayer 205 and Tryparsamide, the results of which are recorded elsewhere, two other drugs were tried out during the year. The firms supplying these drugs naturally wished the results to be kept confidential unless they were successful, and all that remains to be stated is that both drugs were given a thorough trial and were found of little value unless possibly as adjuncts to Bayer.

Though this is mainly what is being done now, there are other branches of research which are of practical importance to the Territory and ought to be undertaken :—

1. The relationship between infected fly and man in bush villages, with special reference to the possibilities of direct transmission. This would be full-time work for many months for one Medical Officer, expert in fly dissections.

2. The relationship between fly, game and man on the chief fishing rivers.

This would involve applying the precipitin test to a large number of flies, the adhesion test, as well as animal inoculations, to trypanosomes found in game, and a blood record over a period of years of the fishermen using the rivers. This work could be conveniently undertaken on the Ugalla River, using Tabora as a base.

3. Influence of diet on susceptibility and drug treatment.

This could be carried out at one of the larger treatment centres. It is hoped to commence work on the first of these next year (1929).

VI.—RESULTS OF PREVENTIVE MEASURES.

The policy of collecting scattered forest populations into large settlements either at the forest edge or in the forest itself, and at the same time treating sleeping sickness in the settlements, has now been under observation for three years in Tabora and Ufipa Districts. The first forest settlements in Ufipa were started with a certain amount of misgiving.

Sleeping sickness was rife, bush clearing for the new gardens had to be done, and new houses built by the people who had to be moved, and, to add to the anxiety, there was an epidemic of influenza less than 100 miles away. Under the circumstances the move would not have been attempted had Bayer 205 not shown promise of good results in early cases. It was hoped that, with this drug to fall back upon, the disease could be controlled even if it showed a tendency to increase. From the beginning, however, though cases continued to occur, there was no appreciable increase in the incidence; on the contrary, so far as one could see, there was a decrease.

After a few months, with the exception of one particular site (the north-east corner of Rungwa Settlement in Ufipa), nearly all, if not altogether, the new infections were traceable to visits outside the settlements.

Resettlement has gone on, year by year, since 1925 in Ufipa, but the work is not yet completed, so that all these years the populations of the new settlements were able to visit their infected friends in their bush villages. Besides this, the old evacuated villages have been used as camps by those engaged in collecting wild honey and wax, the villages possibly remaining foci of infection. As a honey and wax industry is one of the *raisons d'être* for forest habitations, it is not considered either expedient or practicable to suppress this vocation altogether at present, though bee-keeping within the limits of the settlement is encouraged as much as possible.

But even with these complications—diminishing now year by year—it has been possible, with a comparatively small staff, to keep the disease under control in these settlements in a way that was impossible when the whole forest was populated at an average density of one person to the square mile.

The part of the Rungwa Settlement already referred to was a special problem of its own. The site of this settlement was chosen so that as much as possible of the Rungwa River fishing grounds would be within the clearing. Some of these grounds, however, remained outside the clearing on the north and south. The southern ones, though the more popular, are not so important, as fly is scanty there for most of the year. On the north it is different. Fly is more plentiful and the fishing grounds are only a few miles beyond the clearing. It is thus easy for fishermen, not only to be bitten in a frequented locality, but to bring flies with them to their homes.

It is hoped to tackle this situation in the near future. The areas cleared, populations settled and staff engaged on the work will be seen in previous annual reports. The smallest concentration in Ufipa now is 3 square miles with a population of about 100, and the largest 14 square miles with a population of about 5,000.

The conclusion arrived at is that the collection of forest populations into large farming settlements is a safe and feasible proceeding. It facilitates control of sleeping sickness and other diseases, simplifies administration, and, in suitable circumstances, lays the foundation for the building up of stable and progressive communities. When it fails it will be on economic and not on hygienic grounds.

Great care should be exercised in choosing sites. The water supply must, of course, be ample, the land must be suitable for both economic and food crops, and there must be room for expansion.

While the ideal site is good farming land on the forest edge near a market and cheap means of transport, and while there are many such sites still unoccupied, the wholesale evacuation of forest, with the sole object of material or hygienic advantage, is not recommended. Apart from the fact that such an extreme measure creates resentment, with its own attendant problems, there are two distinct disadvantages in leaving large tracts of forest, and in particular whole chiefdoms, unpopulated. One disadvantage is that there are large unoccupied tracts with no chief to claim or supervise them; they must be expected to become the haunts of undesirable characters from all parts, who, apart from anything else, will create our problems afresh.

Another disadvantage is that at the present stage of development we do not know what the mineral and other possibilities of these places are.

With these qualifications, the aim should be to make scientific farming the foundation on which to build up sleeping sickness control, taking care that stock-raising does not outstrip cultivation of the land.

It is not yet possible to say what the minimum size of a settlement ought to be, but settlements of about 4,000 people with clearings of 10 square miles, and scope for doubling these clearings, have proved satisfactory. It is, of course, necessary in these settlements to make provision, either from the beginning or at least within three years, for rotation of crops, fallows, and, in time, introduction of stock.

VII.—EPIDEMIOLOGY.

It has not yet been possible to make a complete study of any outbreak in the Territory, but sufficient information has accumulated to make the salient feature of epidemics clear.

The close association between man and fly in bush villages has already been frequently emphasized. Where the people have not been resettled they are bitten on their hunting and fishing expeditions, when they collect honey and wax, when they hoe their gardens, fetch their water or collect their firewood, and very frequently inside their houses. Most of them, nevertheless, lived for years under these conditions without contracting sleeping sickness. Over hundreds of square miles where the people have been notorious hunters, there is no evidence that any sleeping sickness occurred for years, and there could not be, in any case, more than an occasional instance of infection. This describes the "normal" forest conditions at present.

But while conditions have been fairly stable over short periods of time there has been a slow but important change in the last 50 years. During that period there has been, for various reasons, but largely as a result of redistribution of population, a gradual intensifying of the contact between man and tsetse. Of this there is ample evidence in Ufipa, Tabora and Kahama districts.

It is easy to imagine that before this contact was so intense there may have been sporadic cases of unrecognised *T. brucei* infection in man for an indefinite period, and that the rate at which these cases occurred changed but little during the period of increased infestation until a stage was reached when association between man and fly was sufficiently close and continuous for man-fly-man infection to take place. This condition having been established, all that would be necessary would be a fortuitous occurrence of a sufficient number of cases in a sufficiently small compass of time and space to start an epidemic. An area might in this way remain ripe for an epidemic for years before the chance combination mentioned had occurred.

Having occurred, there is no apparent reason why an epidemic wave should not spread as if the virus concerned were a true human parasite.

This view, supported as it can be made to be by the definite history of an increased association between tsetse and man, and an almost undiminished one between man and game, is not contradicted by the study of the spread of sleeping sickness in the three districts mentioned, and it does not appear necessary to assume any increase of virulence on the part of the parasite.

This point of view, which is, of course, an old one, is presented not as the probable explanation of what has occurred so much as to show that the man-fly-man infections and the type of spread that has occurred in 1921-1928, though suggestive of a purely human parasite, do not exclude the possibility that it may be *T. brucei*, unchanged, but with unique opportunities for spread.

The epidemic, which has slowly spread through Ufipa, Tabora and Kahama Districts, was first reported from Ufipa, the least known until 1924 of all the three districts. We know that the disease was there, 100 miles away from Lake Tanganyika, at least as early as 1921. We know that it spread from a focus at Tumbu both southwards and north-westwards. In Southern Tabora with its comparative compactness, better communications

and more enlightened chiefs, we can find no trace of it earlier than 1924 or late 1923. In Northern Tabora, also more civilised than Ufipa, we are unable (if one very doubtful instance in 1921 is excepted) to trace it earlier than 1925 or 1926, and about 1926 is the earliest we can trace it in Kahama.

In Ufipa in 1925 and early 1926, we were able to observe a westward spread to villages which we knew to be free from the disease before. Similar spreads have been observed in Tabora and Kahama this year (1928).

Sometimes it is possible to trace the outbreak of sleeping sickness at a village to the arrival there of an infected person, but in most instances, intercommunications between villages, even when these are many miles apart, is on such a scale and opportunities for association with infected persons in the presence of fly so numerous, that it is impossible to know where and how the first infect at a village contracted the disease.

In the majority of over 1,500 cases who came under observation during the year, and of other hundreds observed in previous years, there are definite histories of living among tsetse in the presence or near vicinity of infected persons. The blood of some of these persons are known to have been swarming with parasites before treatment. That is, not only were the conditions there for man-fly-man infections, but probably for direct transmission by the agency of "interrupted feeders" as well.

A few instances remain in the case of hunters and fishermen where a game-fly-man cycle may possibly be going on.

The conclusion arrived at is that a mere field study of epidemiology cannot go far in throwing light on the vexed question of the relation between *T. brucei* and *T. rhodesiense*. All the facts observed can be accounted for satisfactorily whether we regard the two as distinct species or as one. (There is no difficulty in finding possible human sources of infection for Ufipa, e.g., Rhodesia, Nyasaland, etc.)

The one outstanding observation is that during an epidemic the only vertebrate host of importance is man.

The situation in Ikoma, Mwanza Province, is of interest, because attention has been focussed on it through Professor Kleine's work for the International Commission on Human Trypanosomiasis, in which the non-importance of game as a reservoir of infection is stressed. There are certain aspects of the situation there, not emphasized in the Commission's report, that may be mentioned.

In Ikoma the sick come at least as much from villages in open country as from forest dwellings. The people are great hunters and a favourite method of hunting is to lie in wait with poisoned arrows at tsetse-infested drinking pools on the rivers. Women fish at similar pools. More flybites must be received while hunting than at any other occupation, and this frequenting of game haunts in the presence of tsetse, as compared with association with sleeping sickness cases, is on a much bigger scale than in any other known sleeping sickness area in the Territory.

With regard to the obviousness mentioned in the Commission's Report, that the Ikoma parasite came from the *palpalis* haunts on Lake Victoria, or the Mori River, the possibility of this must be admitted, as must also the possibility that Ikoma has formed the bridge by which this infection reached Maswa, but we have no proofs. What we know is that the traffic between the sleeping sickness areas of Maswa and Ikoma is very much greater than between Ikoma and the chief *palpalis* places on the lake and rivers.

The information available merely shows in clearer relief than usual the different possible sources from which this outbreak may have sprung.

While its genesis is being under review there is still another possible source of infection that ought to be considered, namely, the Wandorobo tribe. A section of this tribe live a most primitive life in the forest to the south and south-east of Ikoma.

These people neither cultivate nor keep stock. Until recently, they are said to have lived by hunting, collecting wild grasses and fruit, and digging up roots.

Little is known about them, but they appear to have lived for countless generations just the kind of life that would lead to tolerance of trypanosome infection.

Recently they have been more in contact with other tribes and therefore have had more opportunities for disseminating infection.

The idea that they may have acted as a reservoir of trypanosome infection may be entirely erroneous, but the possibility appears to be sufficiently weighty to warrant an investigation.

VIII.—RESULTS OF TREATMENT.

Two new drugs, tried out during the year, have already been referred to under Research.

2. *Treatment with Bayer 205*.—Observations made during the year show that trypanosomes tend to disappear from the cerebro-spinal fluid a few days after intravenous injections of Bayer 205. When present after a second weekly injection they often disappear after the fourth. Occasionally, there are parasites after the fourth injection. Animal inoculations would probably show a higher percentage of positives than mere microscopic examination, but this does not alter the fact that they diminish from being present in fair numbers to vanishing point.

As a rule, when the parasites persist, there is a rise in the cerebro-spinal cell count, the number being considerably higher than in the average untreated case of the same duration. A rising cell count under Bayer treatment continued over a month is therefore looked upon as a bad prognostic sign and a certain indication for subsequent treatment with tryparsamide.

Late cases treated with varying doses of Bayer up to a total of 5 grammes, have invariably died. Even cases that were able to move about but had reached the œdema stage before treatment have seldom recovered.

With early cases, on the other hand, apparent recovery is the rule. If taken in the first few days of the original fever, probably every uncomplicated case should recover.

3. *Treatment with Tryparsamide*.—A few of the cases treated in 1924 and early 1925 are still living, but, generally speaking, this drug, given by itself, is not satisfactory. The blood or cerebro-spinal fluid or both may show parasites even after 12 injections (a total dosage of 36 or more grammes).

4. *Bayer and Tryparsamide combined*.—It is difficult to assess the value of this form of treatment, because of the fact that most patients find the treatment too prolonged and irksome to take a complete and regular course. Still, with this disadvantage, it is the only form of treatment that has shown apparent recoveries in late cases. It does not show the same good results in all instances, but many cases with well-marked asthenia and hardly able to walk, have remained well two and three years after commencing treatment.

5. *Stibamine Glucoside*.—Dr. Keevill commenced treatment on a series of 5 cases over 2 years ago. Not one did satisfactorily. They either died or had to be treated with other drugs.

6. The following are the routine methods of treatment at present recommended. It is probable that modifications of these methods will be recommended from year to year as results accumulate :—

Treatment No. 1.

1st	Day.—Bayer 205, grm. 1 in 3 to 10 c.cs. distilled or rain-water.
8th	“ “ “ “ “ “
15th	“ “ “ “ “ “
22nd	“ “ “ “ “ “
29th	“ “ “ “ “ “

Treatment No. 1A.

1st	Day.—Bayer 205, grm. 1 in 5 to 10 c.cs. distilled or rain-water.
8th	“ “ “ 1 “ “
15th	“ “ “ 1·5 “ “
22nd	“ “ “ 1·5 “ “
29th	“ “ “ 1·5 “ “
36th	“ “ “ 1·5 “ “

Should albuminuria develop during this course of treatment, revert to 1 grm. doses.

Treatment No. 2.

1st Day.	Tryparsamide, grm.	2	in 6 to 10 c.cs., distilled or rain-water.		
8th	"	3	"	"	"
15th	"	3	"	"	"
22nd	"	3	"	"	"
29th	"	3	"	"	"
36th	"	3	"	"	"
43rd	"	3	"	"	"
50th	"	3	"	"	"
57th	"	3	"	"	"
64th	"	3	"	"	"
71st	"	3	"	"	"
78th	"	3	"	"	"

Treatment No. 2A.—The same as No. 2, except that an interval of one month is allowed between the fourth and fifth injection and again between the eighth and ninth injection.

Treatment No. 3.

1st Day.	Bayer 205, grm.	1	in 3 to 10 c.cs., distilled or rain-water.		
8th	Tryparsamide, grm.	2	in 6 to 10 c.cs., distilled or rain-water.		
15th	"	3	in 8 to 10 c.cs.	"	"
22nd	"	3	"	"	"
29th	"	3	"	"	"
36th	Bayer 205, grm.	1	in 3 to 10 c.cs.	"	"
43rd	"	1	"	"	"
50th	"	1	"	"	"
57th	"	1	"	"	"
64th	Tryparsamide, grm.	3	"	"	"
71st	"	3	"	"	"
78th	"	3	"	"	"
85th	"	3	"	"	"
92nd	"	3	"	"	"
99th	"	3	"	"	"
106th	"	3	"	"	"
113th	"	3	"	"	"

Should there be albuminuria after the Bayer treatment, postpone the remainder of the Tryparsamide treatment until one month after the disappearance of the albuminuria.

Treatment No. 3A.—The same as No. 3, except that an interval of one month is allowed between the fifth of Bayer and the fifth dose of Tryparsamide (*i.e.*, after the 57th day), and between the eighth and ninth doses of Tryparsamide.

Treatment No. 4.—Bayer, 205, grm. 1 in dilutions as above on alternate days, until 5 grm. are given.

Rest 8 weeks.

After the 8 weeks' interval, Tryparsamide 3 grm. weekly, dissolved as above, for 8 weeks.

Rest 8 weeks and after the interval, Bayer 205, grm. 1 weekly for 8 weeks.

Rest 8 weeks and after the interval, Bayer 205, grm. 1 weekly for 5 weeks.

NOTE.—In all the above methods of treatment the drugs are preferably given intravenously, but they may also be given intramuscularly.

Where it is desired that one mode of treatment should be followed (*e.g.*, in cases where subordinates are conducting it) a good routine is to proceed as follows:—First give Treatment No. 1 whatever the stage of the disease. At the completion of the treatment examine the urine for albumen. If no albumen is present wait one month and then go on to Treatment No. 2. If albuminuria is met with examine the urine twice weekly and when it is free from albumen for a month, give Treatment No. 2.

Should dimness of vision develop during No. 2 Treatment stop it and substitute No. 1A.

Where more accurate work can be done proceed as follows:—Give the patient 1 grm. Bayer (if the patient is very ill divide the dose into two, giving the second part after an interval of 24 hours).

Next day, or at the latest within a week, examine the cerebro-spinal fluid. If normal, proceed with Treatment No. 1, or, as a precaution, with No. 1A. When this course is completed, examine the cerebro-spinal fluid again. If still normal (case type 1) the patient may be discharged, but, if it is desired to take additional precautions, Treatment No. 2 or 2A may be given after a month's interval (or in case of albuminuria, a month after the albuminuria has cleared up). If just after the first injection of Bayer there are cells present, but not more than 20 per c.mm., give Treatment No. 1 or 1A. One month after the last injection examine the cerebro-spinal fluid again. If normal (case type 2) proceed as in type 1. If cells are still present (case type 3) give Treatment No. 2 or 2A at once.

If just after the first injection of Bayer the cell count is over 20 per c.mm. (case type 3) give Treatment No. 3 or 3A.

As an alternative to the above, Treatment No. 4, or No. 1, followed by No. 2, may be given in any type of case, provided no toxic symptoms develop.

When there are no facilities for the examination of the cerebro-spinal fluid, proceed as follows :—

Treat as case type 1, cases of less than 15 days' duration without appreciable emaciation or œdema and cases of the symptomless "carrier" type.

All others should be treated as case type 3.

7. *Remarks*.—Examination of the cerebro-spinal fluid would appear to be of great value as a guide to treatment, though its full scope cannot be known for years yet. For instance, patients may be seen after treatment with Bayer who look the picture of health. Their blood shows no parasites, but if their cerebro-spinal fluid is examined, it may be found that the cells are increased and parasites present.

Another observation that deserves attention is in cases that have remained well for years after treatment, but who still maintain an abnormally high cell content in the cerebro-spinal fluid. What the ultimate fate of these cases is going to be only the distant future can reveal.

Tables showing the results of treatment are given in Appendix II.

IX.—ACTION OF BAYER 205 AND TRYPARSAMIDE IN OTHER DISEASES.

Dr. Fairbairn has examined a series of cases to ascertain whether these drugs have any action on ankylostomes. Ova can still be found in the fæces after four one-grm. injections of the former and twelve four-grm. injections of the latter.

Observations on the action of Bayer 205 on relapsing fever are being carried out.

X.—THE SITUATION IN THE DIFFERENT DISTRICTS.

1. *Maswa and Kwimba Districts.*

No new focus of infection was observed. The chief activities consisted of the treatment of cases and the clearing of bush to relieve the congestion prevailing in the open country.

Clearings were done in conjunction with the Administrative, Game and Veterinary Departments, and the Native Authorities.

A clearing, estimated at 20 square miles, was made to the south-west of the junction of the Simiyu and Ididi Rivers under the general supervision of the Game Department, the primary object of which was to release land for grazing and cultivation, but it also forms part of a general scheme to clear the fishing and watering pools on the two rivers.

In Maswa seven clearings, under the general supervision of the Medical Department, were made, a total area of about 11 square miles being cleared.

The objects of these clearings, which form part of a general plan, were (a) to clear the chief fishing places on the Duma River, and (b) to relieve the congestion in Nassa, Ntussu and Itilima. A sketch of the clearings made, and of the general scheme being followed, is attached.

Assistance was also given to the other departments mentioned, with supervisors, on a clearing made on the Simiyu River, north of Shanwa, to open up a large mbuga for grazing.

Cases.—The following is a table of cases diagnosed and deaths reported in the different months :—

Month.							New Cases.	Deaths.
January ..	..	..	..	..	..	..	12	3
February ..	..	..	..	..	..	..	9	3
March ..	..	..	..	..	..	..	12	3
April ..	..	..	..	..	..	..	21	4
May ..	..	..	..	..	..	..	4	1
June ..	..	..	..	..	..	..	1	1
July ..	..	..	..	..	..	..	1	—
August ..	..	..	..	..	..	..	—	2
September ..	..	..	..	..	..	..	1	2
October ..	..	..	..	..	..	..	1	1
November ..	..	..	..	..	..	..	—	3
December ..	..	..	..	..	..	..	—	20
Total ..	..	..	..	..	..	..	62	43

2. Musoma District.

No fresh focus of disease was found. Unfortunately Dr. Fairbairn had to be withdrawn from the district in July, and the programme of work had to be curtailed.

The following is a table of the cases diagnosed and deaths reported during the different months :—

Month.							New Cases.	Deaths.
January ..	..	..	..	..	..	..	1	1
February ..	..	..	..	..	..	..	16	—
March ..	..	..	..	..	..	..	14	4
April ..	..	..	..	..	..	..	5	1
May ..	..	..	..	..	..	..	7	2
June ..	..	..	..	..	..	..	4	1
July ..	..	..	..	..	..	..	7	5
August ..	..	..	..	..	..	..	9	—
September ..	..	..	..	..	..	..	12	4
October ..	..	..	..	..	..	..	10	1
November ..	..	..	..	..	..	..	19	7
December ..	..	..	..	..	..	..	6	—
Total ..	..	..	..	..	..	..	110	26

3. Ufipa District.

Except for an unimportant outbreak in Gongwe, south-west of Urwira, there has been very little change in the situation. There has been an increase of cases in Nyonga, which may be due to an increased activity in collecting honey and wax, or may be due to the fact that more cases came under observation when 900 people, who commenced new settlements in Nyonga in 1927, moved in during 1928.

It is reported that the people of Nyonga, Urwira, Manga-Usevya and Rungwa, are contented. On the other hand, the population of Ilunde has gone down in a year from over 1,600 to 700, the other 900 having gone, it is reported, to Ukimbu. This matter is being taken up with the District Officer, Ufipa.

If the chief of Ilunde is unable to maintain control of his people and if the population there dwindles much more, it will be necessary to consider the evacuation of Ilunde and removing its people to one or other of the existing concentrations.

Clearings have been made at Ilunde, Nyonga, Urwira and Rungwa. The following table gives the estimated amount cleared and the population :—

	Amount cleared in 1928. sq. miles.	Total Area of clearing. sq. miles.	Population end of 1928.
Ilunde ..	$\frac{1}{4}$	$6\frac{3}{4}$	700
Nyonga (with Shama) ..	$2\frac{1}{2}$	$15\frac{1}{4}$	6,000
Urwira ..	2	14	4,000
Manga-Usevya ..	0	11	5,000
Rungwa ..	1	14	5,000

The number of people concentrated during the year is uncertain, as resettlement in progress during 1927 was not completed by the end of that year, but altogether 900 people were resettled in 1927 and 1928.

These are incorporated in the Nyonga settlement.

With the exception of Gongwe, a few ferrying and fishing villages on the Ugalla and Rungwa Rivers, and certain unimportant bush villages, the people between Ukimbu on the east, Rungwa on the south, Ubende on the west and the Ugalla River on the north are now believed to be concentrated.

It will, however, be necessary to make a survey next dry season to ascertain how complete the evacuation is.

The following table shows the cases diagnosed and deaths reported during the different months :—

Month.							New Cases.	Deaths.
January ..	..	..	..	..	..	..	3	7
February ..	..	..	..	..	..	..	8	3
March ..	..	..	..	..	..	..	11	13
April ..	..	..	..	..	..	..	2	—
May ..	..	..	..	..	..	..	6	—
June ..	..	..	..	..	..	..	13	6
July ..	..	..	..	..	..	..	8	13
August ..	..	..	..	..	..	..	4	3
September ..	..	..	..	..	..	..	4	1
October ..	..	..	..	..	..	..	15	5
November ..	..	..	..	..	..	..	9	3
December ..	..	..	..	..	..	..	18	5
Total ..	..	..	..	..	..	..	101	59

4. Kigoma District.

(a) *Tanganyika Lake Shore*.—The situation remains much the same as last year. An outbreak was reported south of the Belgian border, but a dispenser, sent there to investigate, failed to find any cases.

Clearing of the breeding places of *G. palpalis* along the lake shore between Bangwe point and Kigoma town was commenced, and it is hoped to complete the work during the coming year. One difficulty encountered in the work is the number of caves and ledges in which *G. palpalis* breeds. It remains to be seen whether mere clearing of the scrub will lead to disinfection or whether the rocks will afford sufficient cover.

The following table shows the cases diagnosed and the deaths reported during the different months :—

Month.							New Cases.	Deaths.
January ..	..	..	..	..	..	..	1	—
February ..	..	..	..	..	..	..	—	—
March ..	..	..	..	..	..	..	1	—
April ..	..	..	..	..	..	..	—	—
May ..	..	..	..	..	..	..	1	—
June ..	..	..	..	..	..	..	1	—
July ..	..	..	..	..	..	..	—	—
August ..	..	..	..	..	..	..	—	—
September ..	..	..	..	..	..	..	—	—
October ..	..	..	..	..	..	..	—	—
November ..	..	..	..	..	..	..	—	1
December ..	..	..	..	..	..	..	—	—
Total ..	..	..	..	..	..	..	4	1

(b) *Eastern Kigoma*.—There is reason to believe that there might be cases here, but it has not yet been possible to make a survey.

5. Tabora and Nzega Districts.

Towards the end of 1927 an outbreak was discovered in the northern part of Tabora District, and just on the western border of Nzega.

No further light, beyond what was recorded in the last Annual Report, has been thrown on the origin of the outbreak, but its extent and spread have been carefully followed by Dr. Edmond, who was in charge of the area for the greater part of the year.

Dr. Edmond draws attention to the position of the earliest known focus in the area. It borders on the five chiefdoms and sub-chiefdoms of Usagusi, Unyambewa, Ukumbi, Kwande and Urambo. It is also traversed by two well frequented paths, one between Urambo and Unyambewa, and the other between Nyuwi and Ushietu.

He traces the disease from this centre first to Usagari, Unyambewa, Ukumbi and Kwande, and at a later period to Urambo Proper (*i.e.*, South-Western Urambo) and Ibanda.

Other two foci were also observed, one in Usagussi, spreading northwards to Uyowa, and another in Unyangwira, in the south-east, which has not yet been investigated.

The known infected villages nearest to Tabora Town are Itema, 10 miles to the south, and Umanda, 15 miles to the north-west.

Treatment Centres.—Besides Sekonge and Ussoke, two additional camp hospitals were opened, one at Urambo (Tabora), and one at Mambali (Nzega). The Ussoke centre was moved to Ussoke Mission under Miss Jensen, a mission sister, who is working under Dr. Keevill of Sekonge.

Clearings.—A clearing 2 miles long and 600 to 800 yards in width was made along the Tabora-Sekonge road a few miles to the south of Kizigo School.

This clearing, important though it may be as a step towards protecting Kizigo School, the Seminary of Kiparapara, Chief Saidi's village, and Tabora township from the encroachment of fly from the south, was, for various reasons, unnecessarily costly. The main reasons for this high cost were the failure of the chief to produce the number of men promised on the appointed date, failure of the first supervisors to carry out their instructions, and an accidental fire.

A second clearing was attempted at Urambo with the intention of resettling the forest people. It was carried out with indifferent success on account of labour difficulties.

A third clearing of about $1\frac{2}{3}$ square miles was made at Kakola, but only the felling was completed. The work was partly spoiled by an early fire, but piling and burning can be completed as the land is required.

A small clearing, sufficient to accommodate 100 families, was also made at Mambali, Unyambewa, Nzega District.

Concentrations.—It was intended to evacuate all the forest villages of Urambo and to bring them into the clearing made there, but for various reasons this was not carried out. Owing to the fact that the headmen did not attend to select the exact sites of their gungulis before the clearing was commenced, the most suitable, or at least, the most popular, parts were not cleared. More important than this were certain intratribal difficulties which appear to have led to a certain amount of passive resistance.

It is most unfortunate that the Native Authority did not have the capacity, or that European personnel was not available, to complete the concentration this year.

Similar difficulties were met with in attempting a concentration at Mambali, Nzega, but as the evacuation of only a hundred families was prepared for, the case here was less serious.

The following table shows the cases diagnosed and the deaths reported during the different months :—

Month.							New Cases.	Deaths.
January ..	..	..	..	..	..	..	30	1
February ..	..	..	..	..	..	..	36	11
March ..	..	..	..	..	..	..	25	7
April ..	..	..	..	..	..	..	22	2
May ..	..	..	..	..	..	..	23	12
June ..	..	..	..	..	..	..	33	4
July ..	..	..	..	..	..	..	34	7
August ..	..	..	..	..	..	..	49	5
September ..	..	..	..	..	..	..	47	10
October ..	..	..	..	..	..	..	73	14
November ..	..	..	..	..	..	..	63	16
December ..	..	..	..	..	..	..	60	10
Total	..	..	..	..	..	..	495	99

6. Kahama District.

The first case diagnosed in the district was in January, 1928, but the disease was epidemic for some months before. The earliest history that one has been able to obtain is of several deaths which occurred in a small village in Usonge, called Mtema, in or about 1926. The deaths were attributed to witchcraft. A history of similar occurrence before then in neighbouring villages has not been obtained.

In Mtema out of a family of eight, comprising the headman, his 3 wives, 3 sons, and a daughter, the father and 2 sons died in the village, 2 of the wives went to a village in Ngogwa belonging to their late husband, while the one remaining son, with his mother and sister went to Msala, in Masumbwe. This move is stated to have taken place late in 1926 or early 1927. The girl shortly afterwards died in Masumbwe, having first of all moved, temporarily at least, into still another village.

Subsequently the headman of Msala, an old man who did not travel far beyond his village, became ill and died. Both he and the girl from Mtema are stated to have had symptoms of sleeping sickness.

Whether other deaths occurred at Msala (which before had 12 adult males with their wives and families) is uncertain, but the death of the headman and also sickness amongst those remaining appears to have been the signal for the breaking up of the settlement. Two men with their families went to Mpunze, where one died; the refugee from Mtema went with his mother to Shegunga, in Ulewe, where the mother died; others again went into different parts of Masumbwe itself, where some of them subsequently died. Among these places was Mganga's, which afterwards suffered the same fate as Msala. Some of the sick refugees from it went to the neighbouring settlement of Kazozi, in Mbogwe. Whether these were the first sleeping sickness cases in Kazozi is uncertain, but a number of new cases occurred there after their arrival.

The second place in Masumbwe to get the disease was Uzigura, about 2 miles from Msala, the first illness commencing shortly after that of the Msala headman.

It has not been possible to follow in detail the spread outwards from the Usonge-Masumbwe focus, but there was a general spread, corresponding with the distribution of relatives and friends, into Mpunze, Ukuni, Western and North-Western Mgogwa, Southern Mbogwa, Bukombe, Ushirombo, Ungoni, Runzewe and Bugomba.

In all 948 cases were diagnosed microscopically during 1928, but it is probable that at least 1,500 contracted the disease during the year.

In Masumbwe, where the disease has been most studied, the incidence of the disease, in a population of about 1,200, is estimated at 22 per cent. in one year.

It may be of some interest at this stage to trace the changes that have taken place in the environment of the people in this area in recent years.

Thirty or forty years ago, along what is now the Kahama-Biharamulo road, there were large settlements, with cattle, at Mkwemi, Masumbwe, Bukombe, Ushirombo, Ulangwa and Idiobahika. This was also true of Ukuni (Pundaguzi's), Mpunze, Usonge and Bugomba.

Frequent raids by the Wangoni and the Wasagari had diminished the stock everywhere except at Bugomba where the Wangoni's stolen cattle were kept. Nevertheless the herds, to some extent, held their own.

After the German occupation a series of incidents—notably the release of recently acquired slaves, intensive labour recruiting, the rise of almost uncontrolled family villages in the bush (a safe enterprise now that the country was being administered)—all led to diminution and dispersal of the population. The War, with the military demands for cattle and people, and its aftermath, influenza, completed the disintegration; both cattle and people were enormously reduced; bush and tsetse encroached rapidly until now,

only Ushirombo and Mpunze have cattle, and even in these the herds are dwindling. There is hardly a village—there are certainly not 300 houses—in all this vast one-time cattle country which is not in contact with tsetse for some part of the year. Even in Ushirombo, which appears to have been comparatively fortunate, the population, according to the White Fathers, has decreased to one-third in the last thirty years.

B.—*The population* of the chief affected areas, according to a census taken about the middle of the year, and cases up to the end of the year are as follows :—

	Popula- tion.	Known Cases.	Estimated Cases.
Western Ngogwa (excluding Masumbwe)	600	74	150
Masumbwe	1,242	236	270
Southern Mbogwe (Nambale)	881	61	100
Southern Usumbwa	7,500	385	650
Ungoni	1,023	40	80
Bugomba	1,084	10	20
Mpunze	2,814	50	80
Other Places	—	92	150
Total		948	1,500

C.—*Clearings and Resettlement*.—The following clearings were made :—

(a) Western Ngogwa (excluding Masumbwe).—About $\frac{1}{2}$ square mile was cleared to the west of Ngogwa village and 180 people settled there.

(b) Masumbwe.—A total of $\frac{3}{4}$ square mile was cleared in six separate plots on the south of Masumbwe village, and all within 2 miles of Kahama road : 567 people were settled there. It will be necessary to move only a small proportion of the remaining population, as they will be within the area into which it is proposed to extend the clearings.

(c) Bukombe.—Thirty acres were cleared. The families of treated patients from Usonge, eighteen in all, had houses built for them there, and they are settled there now, forming the nucleus of what will be a settlement of all the Usonge people next year.

(d) Ushirombo.—About $\frac{1}{4}$ square mile was cleared here for treated patients who might want to settle. Only a few families have moved in yet.

When possible it is desirable that a trunk road should pass some hundreds of yards to one side of an isolated clearing and not through it, so that fly is not carried into it by passing vehicles.

Unfortunately it was not possible to arrange this at the three last clearings, as the existing roads passed through the most suitable plots of land.

D. *Agriculture*.—A system of rotation drawn up by Mr. Richardson, Agricultural Officer, Shinyanga, has been introduced into Masumbwe.

The object of introducing this is to break the present Native practice of cultivation, which leads to exhaustion of the soil in a comparatively few years, and makes permanent settlements well-nigh impossible.

E. *Agriculture Surveys*.—The following areas were surveyed by Mr. Hulley, Agricultural Surveyor :—

Western Ngogwa, Masumbwe, Bukombe, Ushirombo, Kondebona, Kasilu, Ikuzi, parts of Bugomba and Ulewe, Bulungwa, Mpunze, and parts of Uyogo. The object of these surveys were to ascertain what the best sites are for resettling the people.

F. *Treatment Centres*.—Cases are being treated at Kahama Hospital, Kahama Clinic, Uyogo Clinic, Itaranganya Clinic, Runzewe Clinic, and also at Masumbwe and Ushirombo.

The following is a table of cases diagnosed and deaths reported during the different months :—

Month.							New Cases.	Deaths.
January ..	..	..	..	..	..	..	1	—
February ..	..	..	..	..	..	..	13	—
March ..	..	..	..	..	..	..	38	1
April ..	..	..	..	..	..	..	64	4
May ..	..	..	..	..	..	..	73	11
June ..	..	..	..	..	..	..	62	5
July ..	..	..	..	..	..	..	84	7
August ..	..	..	..	..	..	..	52	23
September ..	..	..	..	..	..	..	84	15
October ..	..	..	..	..	..	..	120	16
November ..	..	..	..	..	..	..	223	30
December ..	..	..	..	..	..	..	134	24
Total*	..	..	..	..	..	..	948	136

* Including one European, one Indian and one African ; members of the Medical Staff.

7. Manyoni District.

Except for visits by scouts, no survey of the district was made. Six cases were diagnosed microscopically from slides brought in by these scouts. It is believed that infection has spread there either from Unyangwire, in South-Eastern Tabora, or from Ukimbu, in Ufipa.

8. Kilwa District.

Beyond surveys and treatment of cases, no work of importance was done in the district during the year.

The following is a table of cases diagnosed and deaths reported during the different months :—

Month.							New Cases.	Deaths.
January ..	..	..	..	..	..	..	—	—
February ..	..	..	..	..	..	..	11	4
March ..	..	..	..	..	..	..	—	5
April ..	..	..	..	..	..	..	2	2
May ..	..	..	..	..	..	..	—	2
June ..	..	..	..	..	..	..	1	2
July ..	..	..	..	..	..	..	—	2
August ..	..	..	..	..	..	..	2	3
September ..	..	..	..	..	..	..	—	1
October ..	..	..	..	..	..	..	4	3
November ..	..	..	..	..	..	..	5	2
December ..	..	..	..	..	..	..	—	2
Total	..	..	..	..	..	..	25	28

APPENDIX I.

A.—*Full-time Officers.*

1. Staff at the end of the year :—

I. Staff at the end of the year.						Station.	Remarks.
Sleeping Sickness Officer—							
MacLean, G.	..	..	..	..	Tabora	..	Off duty 25.2.28 to 21.3.28 and from 24.5.28 to 23.6.28. Light duty, 24.6.28 to 9.9.28.
Medical Officers—							
Edmond, J. J. B.	..	..	..	..	Tabora	..	Commenced duty 29.3.28.
Fairbairn, H.	..	..	..	..	Kahama	..	Returned from leave 28.5.28. Posted to Ikoma. Off duty 1.9.28 to 20.10.28. Temporarily posted to Kahama, 21.10.28.
Coghlan, B. A.	..	..	..	..	Liwale	..	Commenced duty 16.1.28. Transferred to Liwale 3.12.28 from Ufipa.
MacQuillan, C. J.	..	..	..	..	Maswa	..	Commenced duty 1.1.28. Transferred from Tabora to Maswa, 8.4.28.
Theis, J. S.	..	..	..	..	Ufipa	..	Commenced duty 22.11.28.
Agricultural Surveyors—							
MacQuarie, C...	..	..	..	..	Maswa	..	—
White, F. J.	..	..	..	..	Tabora	..	—
Hulley, E. E.	..	..	..	..	Kahama	..	Commenced duty 20.4.28.
Allinson, E. H.	..	..	..	..	Ufipa	..	Commenced duty 4.5.28.
Sub-Assistant Surgeons—							
Sakrikar, G. V.	..	..	..	..	Kahama	..	Off duty from 20.10.28.
Khot, G. K.	..	..	..	..	„	..	Commenced duty 24.4.28.
Compounders—							
Lopez, F.	..	..	..	..	Musoma	..	Transferred from Liwale in June.
Puram, R. E.	..	..	..	..	Maswa	..	Commenced duty April, 1928.
Nand Singh	..	..	..	..	Kahama	..	Commenced duty 24.12.28.
Vaz, C...	..	..	..	..	Liwale	..	Commenced duty April, 1928.
Motor Mechanic	..	..	..	..	Kahama	..	Employed Transport Department, April to August.
Dispensers—							
1	..	..	..	..	Ikoma	..	—
3	..	..	..	..	Tabora	..	—
3	..	..	..	..	Ufipa	..	—
Dressers—							
4	..	..	..	..	Ikoma	..	—
7	..	..	..	..	Maswa	..	—
10	..	..	..	..	Tabora	..	—
12	..	..	..	..	Kahama	..	—
9	..	..	..	..	Ufipa	..	—
2	..	..	..	..	Kigoma	..	—
3	..	..	..	..	Liwale	..	—

2. Officers left during the year :—

Medical Officers—							
Buchanan, J. C. R.	..	..	..	—			On leave.
Noble, G. S. P.	..	..	..	—			„
Compounders—							
Gomes, J. X. E.	..	..	..	—			„

B.—*Officers doing part time.*

In Kahama	..	..	..	..	Dr. Lester, Dr. Wilcocks, Miss Allardes, and five Sub-Assistant Surgeons.		
In Tabora	..	..	..	..	Dr. Keevill.		
In Kigoma	..	..	..	..	Dr. Steel.		

APPENDIX II.

TABLES SHOWING THE RESULTS OF TREATMENT.

Table 1.—Showing the results obtained with a total of 1 to 2 grm. of Bayer 205.

	Cases with no appreciable œdema or emaciation before treatment.	Cases with appreciable œdema or emaciation before treatment.		
		Able to attend to all their wants.	Intermediate Cases.	Not able to attend to all their wants.
Deaths—				
Due to S.S. 	1	1	3	6
Other causes 	—	—	1	—
Causes unknown 	2	—	1	—
Still Living—				
Relapsed and retreated.. ..	—	—	—	—
Relapsed but not retreated ..	—	—	—	—
Remaining well without further treatment 	1	—	—	—
Untraced 	2	1	—	—
Total Treated 	6	2	5	6

Table 2.—Showing the results obtained with a total dosage of not less than 3 grm. Bayer 205 in not less than three doses spread over a period of not more than 4½ weeks.

	Cases with no appreciable œdema or emaciation before treatment.	Cases with appreciable œdema or emaciation before treatment.		
		Able to attend to all their wants.	Intermediate Cases.	Not able to attend to all their wants.
Deaths—				
Due to S.S 	6	8	12	9
Other causes 	2	—	3	4
Causes unknown 	1	2	3	1
Still Living—				
Relapsed and retreated.. ..	2	6	1	2
Relapsed but not retreated ..	—	—	—	—
Remaining well without further treatment 	20	5	—	—
Untraced 	7	2	2	—
Total Treated 	38	23	21	16

Table 3.—Showing the results obtained with a total dosage of at least 3 grm. of Bayer 205 in not less than three doses, followed within a half to three months by tryparsamide with a total dosage of not less than 24 grm. in at least eight doses.

	Cases with no appreciable œdema or emaciation before treatment.	Cases with appreciable œdema or emaciation before treatment.		
		Able to attend to all their wants.	Intermediate Cases.	Not able to attend to all their wants.
Deaths—				
Due to S.S. 	2	2	2	1
Other causes	—	—	3	2
Cause unknown	8	—	—	—
Still Living—				
Relapsed and retreated ..	5	—	—	—
Relapsed and not retreated ..	—	—	—	—
Remaining well without further treatment	9	—	4	1
Untraced 	3	—	—	1
Total Treated	27	2	9	5

Table 4.—Showing results obtained with irregular treatment with Bayer and tryparsamide.

	Cases with no appreciable œdema or emaciation before treatment.	Cases with appreciable œdema or emaciation before treatment.		
		Able to attend to all their wants.	Intermediate Cases.	Not able to attend to all their wants.
Deaths—				
Due to S.S. 	21	16	16	14
Other causes	—	—	—	—
Cause unknown	14	2	12	1
Still Living—				
Relapsed and retreated ..	12	6	1	3
Relapsed and not retreated ..	—	—	2	—
Remaining well without further treatment	27	9	9	6
Untraced 	5	—	—	1
Total Treated	79	33	40	25

Table 5.—Result of treatment with Fournéau 309, giving a total dosage of at least 3 grm. in at least three doses.

	No appreciable œdema or emaciation before treatment.	Appreciable œdema or emaciation before treatment.		
		Able to attend to all their wants.	Intermediate Cases.	Not able to attend to all their wants.
Deaths—				
Due to S.S.	—	—	—	1
Other causes	—	—	—	—
Cause unknown	1	1	2	—
Still Living—				
Relapsed and retreated	1	1	—	—
Relapsed and not retreated	—	—	—	—
Remaining well without further treatment	5	2	—	—
Untraced	—	1	1	—
Total Treated	7	5	3	1

Table 6.—Result of treatment with tryparsamide, giving a total dosage of at least 24 grm. in not less than eight doses.

	No appreciable œdema or emaciation before treatment.	Appreciable œdema or emaciation before treatment.		
		Able to attend to all their wants.	Intermediate Cases.	Not able to attend to all their wants.
Deaths—				
Due to S.S.	—	1	3	2
Other causes	—	—	1	—
Cause unknown	—	—	—	—
Still Living—				
Relapsed and retreated	—	—	—	—
Relapsed and not retreated	—	—	—	—
Remaining well without further treatment	1	—	1	—
Untraced	—	—	—	—
Total Treated	1	1	5	2

Table 7.—Treatment of relapsed cases.

Treatment.	Died.	Recovered.	Total.
Three or more grm. of Bayer 205 or Fournéau 309	5	—	5
Irregular course of tryparsamide or Bayer and tryparsamide combined	8	5	13
Total	13	5	18

Remarks.

(a) Bayer 205.—Most of the cases analysed received 3 to 5 grm. in 3 to 5 injections. Some were treated on the 1st, 5th and 10th days ; some on 1st, 10th and 28th days ; and some on 1st, 10th, 28th and 44th days.

There is no clear indication as to the best interval between injections, except that cases receiving 3 grm. in 3 days have not done so well as those receiving 3·6 grm. in 28 days.

Those who received 5 grm. have done slightly better than those receiving 3·6, but the series are not large enough.

A late case who received 10 grm. in 7 weeks, relapsed after $7\frac{1}{2}$ months, and died 3 months after in spite of treatment with 16 more grm. of Bayer in 1 to $1\frac{1}{2}$ grm. doses.

(b) In the Bayer 205 and tryparsamide combined treatment, Bayer was usually given either as above or at weekly intervals. Tryparsamide was given almost always in weekly injections, with or without a month's interval between the 4th and 5th and the 8th and 9th injections.

All the relapsed cases who made an apparent recovery after retreatment received tryparsamide.

(c) Of the cases who had no appreciable œdema or emaciation, the cerebro-spinal fluid of 22 were examined by Dr. Keevill before commencing treatment. All had a cell count of more than 3 per c.mm.

APPENDIX III.

EXPENDITURE UNDER SLEEPING SICKNESS MEASURES FROM 1ST JANUARY, 1928, TO 31ST DECEMBER, 1928 (EXCLUDING DRUGS).

Sub-head.	Tabora.	Mwanza.	Kigoma.	Lindi.	Totals.
Staff of S.S. Camps—					
Dressers, Scouts, Labourers, etc. . .	6,841·14	2,690·00	2,413·00	2,499·56	14,443·70
Porters and Messengers	3,712·08	1,285·91	1,485·65	124·58	6,608·22
Food for Patients	10,528·94	11,822·89	—	2,751·98	25,103·81
Motor Transport—					
For Staff	5,055·65	3,127·00	—	—	8,182·65
For Patients, Food, etc.	4,202·50	360·00	—	—	4,562·50
Clearings—					
European Supervision	380·00	6,240·00	—	—	6,620·00
Wages and Food	33,866·07	6,486·55	661·65	100·00	41,114·27
Agricultural Surveyors	8,050·00	11,591·93	3,000·00	—	22,641·93
Motor Mechanic	1,250·00	—	—	—	1,250·00
Buildings	3,236·60	—	—	640·00	3,876·60
Sundries	522·65	—	—	—	522·65
TOTAL	77,645·63	43,604·28	7,560·30	6,116·12	134,926·33

APPENDIX IV.

Methods of cultivation employed in the different settlements.

Method 1.—The whole settlement is treated as a unit. The settlers are allowed to grow any crops they wish on their allotments for three years, after which the land has to lie fallow, be grazed, or be put under a perennial leguminous crop for minimum period of three years.

When possible, the ground should be stumped after the three years of cultivation. The boundaries of the settlement are extended as required. This method has been carried out where a more elaborate system is not convenient.

Method 2.—The settlement is divided into units, each unit being a farm for a headman and his people. The unit has a minimum of twenty families, and where a headman has less than twenty families under him he combines with a neighbour to form a unit. These farms are each surrounded by a wind-break of untreated forest, having a minimum width of 25 yards, and an area bearing a ratio of 1 : 9 or more to the area to be cultivated.

Gardens are allowed around the houses, in which anything may be planted. The remainder of the area is divided into two sections, one of which lies fallow or under grazing for five or six years. The other section is divided into three plots, and in each of these plots a settler has an allotment. One of these plots is always controlled by a Government supervisor, who insists on a particular leguminous crop, such as fivi beans, being grown there in a particular year. On the other two plots the settlers may grow what crops they wish, except that they must not mix any other crop with cotton. Each year a new plot is controlled by the supervisor so that no plot is allowed to be over-cultivated. After five or six years the plots are stumped and allowed to lie fallow and be grazed, the other section of the farm being then divided into three plots and brought under cultivation like the former one.

This method is being introduced this year.

Method 3.—Farming units, wind-breaks, and gardens round houses are selected as in Method 2. The remainder of the farm is also divided into two sections, one section lying fallow as before. The section to be cultivated is divided into six plots in each of which a settler has an allotment.

All settlers grow cereals or sim-sim on plot No. 1, ground-nuts on No. 2, cereals or sim-sim on No. 3, pulses on No. 4, and cotton on Nos. 5 and 6. The following year cotton is grown on No. 1, cereals and sim-sim on No. 2, and so on. In six years the cycle of rotation is complete, the ground is stumped, the section allowed to lie fallow or grazed, and the other section brought under cultivation. Where necessary plots are set aside for the whole settlement where rice and potatoes can be grown.

This method was commenced last year.

In Methods 2 and 3 the plots are divided by strips of land on which cassava is grown. In all the settlements a family is allowed eight acres. Should stock increase it may be necessary to increase the allowance, and after stumping, to lengthen the duration of fallow.

Methods 2 and 3 were largely drawn up by Mr. Richardson, District Agricultural Officer. Mr. Hulley, Agricultural Surveyor, also contributed.

A NOTE ON CERTAIN ASPECTS OF THE EPIDEMIOLOGY AND MORBIDITY OF YAWS, WITH SPECIAL REFERENCE TO DIET AND THE PROBABLE INFLUENCE OF *S. pertenuis* ON FAT METABOLISM AND THE FUNCTIONS OF FAT SOLUBLE A AND D IN THE PRODUCTION OF THE TERTIARY BONE LESIONS. BY DR. J. O. SHIRCORE.

In the Annual Medical Report of Tanganyika for 1925, brief notes on the comparative incidence of yaws in the different parts of the Territory were commented upon; and a statement made that there was "an irregularly shaped area comprising the plateau highlands of Iringa, Tabora (north of the Ugalla river) and Dodoma, wherein the incidence is low." There are naturally pockets in other places where somewhat similar conditions hold.

As regards the remainder of the Territory the incidence is high, similarly with pockets of lower or higher incidence. Although some have suggested that insects and indirect contact through wearing infected clothes convey the infection, which might certainly be the case, it may be taken that yaws is almost entirely a direct-contact disease. The Annual Medical Report for 1924, wherein is a table showing the sex incidence of 13,619 cases, indicates that, where the district population is undisturbed to any extent by emigration and immigration, the sex ratio for practical purposes is equal, which tends to support this view. The factors that modify the ratio are the movements of large numbers of male labourers, unaccompanied by their wives, who pass through treatment centres en route to the various plantations; and the stronger males, who are better able to undertake longer and arduous journeys for the purpose of obtaining treatment, than females. I am, however, strongly of the opinion that in those districts where scabies is common, the abrasions caused by scratching offer increased facilities for the spread of infection. Water in many places is scarce during the dry season, and personal uncleanness has a good deal to do with it also.

In the areas, referred to above, the incidence, in my belief, varies with altitude, rainfall, fertility of soil which depends on the geological formation, the amount and quality of the foodstuffs, the level of the culture of the people, and directly with the distribution of the tsetse fly.

The outstanding features of the higher altitude plateau from 3,500 feet upwards, are healthier climate, good rainfall, freedom from tsetse fly over vast areas, which allow for the breeding of cattle. This is not to say that all higher altitude areas are free from tsetse fly, which is not the case. The population of these areas have, therefore, an ample and well-balanced diet, including meat, a variety of vegetables, milk and its products, whereby the necessary intrinsic and accessory factors for the development of a robust disease-resisting constitution are supplied. Not only is there a low incidence of yaws in these regions, but advanced tertiary lesions are much less frequently observed. Compare these conditions with the lower altitude areas of poor soil and rainfall, where annual periods of partial famine occur, where little animal protein, less fat and no milk are available, where large areas are fly-ridden, and the population lives from one year's end to another largely on rice or cassava. The same areas coincide closely with the distribution of hookworm where the health of the population as a whole is below par, high incidence of yaws exists, and gross tertiary lesions are very prevalent.

A point of interest is that when Natives of the low-lying areas, of high incidence, are found in the coastal towns where they are in employment, such lesions as they, who are infected, show, do not as a rule progress, but stay dormant, which may be attributed to the richer and regular nourishment available, hygienic surroundings and personal cleanliness.

It would appear from the above data that low dietetic values, in particular the scarcity of animal protein, the almost entire absence of fat, milk, calcium, and fat soluble A and D, which are intimately associated with calcium metabolism, are the distinctive factors which play an important part in the morbidity and epidemiology of yaws. And when yaws obtains a hold on the human organism and is untreated, one might well speculate as to whether the late tertiary manifestations, the osteoporotic lesions, may not be a result of the breaking down of calcium reserve, by an interference of *S. pertenuis* with fat metabolism and the activities of fat soluble A and D, in the circumstances mentioned.

A NOTE ON THE THERAPEUTIC VALUE OF BISMUTH ARSANILATE IN YAWS. By DR. J. O. SHIRCORE.

A specimen of a watery suspension of this salt sent to Mr. Martindale for analysis was reported by him to contain 50·9 per cent. of bismuth. The actual amount of bismuth arsanilate in suspension, per c.c., was small. Previous trials by myself, Drs. MacNaughton and Armstrong, and recently by Dr. Connell, raised hopes that a more concentrated suspension might be of value in our campaign against yaws and syphilis.

Mr. Martindale, at my request, was good enough to supply me with pint bottles holding 600 c.c. of a sterilised watery suspension, containing 1 gr. per c.c. He also supplied me with "sterules" of 3 gr. in 2 c.c. of oil.

A trial of the watery suspension in some 50 cases of yaws by Drs. Connell and Langan, and about 500 cases by Dr. Latham, has indicated that, while its action is slower, better and probably more permanent results are obtained than by using bismuth sodium tartrate. For example, stomatitis does not occur, even if full doses are used, if a reasonable interval between injections is observed. The local reaction at the site of injection is, however, not infrequently severe.

The suspension in oil, which has been given a trial by Drs. Connell, Langan and myself, gives excellent results, see page 206 of this report, but it is unfortunately too expensive for general adoption, and, besides, would absorb a great deal of time when large numbers have to be dealt with in the field. The question of using the oil "sterules" for syphilis only is under consideration.

I have found that the oil suspension can be given subcutaneously as well as intramuscularly without attendant pain or local reaction. Bismuth arsanilate suspended in oil can therefore be recommended in preference to bismuth sodium tartrate in doses of 3 gr. per 2 c.c. of oil, for adults, with three-day intervals between injections, if a total of 3 to 4 injections are required, as in yaws. If a longer course of treatment is desirable, as in syphilis, 1 injection a week should, perhaps, not be exceeded.

A REPORT ON MALARIA AND BLACKWATER FEVER DURING THE YEAR 1928. BY DR. T. H. SUFFERN, M.B., B.A.O., Ch.B. (ROYAL UNIVERSITY, IRELAND), SENIOR MEDICAL OFFICER, TABORA.

There were 1,115 cases of malaria, with one death. The fatal case was an Indian girl, aged 6 years, who was brought into hospital early in the morning of June 20th, 1928, with the history that she was taken ill with fever and convulsions on the evening of the previous day. The case at first sight looked like one of cerebro-spinal fever or tetanus. There was marked opisthotonus, her back being bent like a bow, the muscles of both hands and forearms were in a state of tonic spasm, and the right leg was rigid in extension. There was also a considerable degree of lock-jaw. The patient was conscious and could swallow a little fluid given with a spoon. The temperature on admission was 102·6°, and the blood showed an extremely heavy infection of subtertian rings. The patient died at 9.50 a.m. on the morning of admission to hospital. Before death, the temperature went up to 105·6°. Unfortunately, a lumbar puncture was not done and a post-mortem was not obtained, but I think it is certain, taking into consideration the very heavy infection of subtertian rings in the peripheral blood, that the case was one of acute cerebral malaria showing most unusual motor symptoms.

There were none of the distressing clonic spasms peculiar to tetanus nor was there a history of wounds or quinine injections.

There was one other acute cerebral case. This was the usual convulsive comatose type and recovered.

There were 11 cases of blackwater fever, with one death. Nine were males and two females.

One patient was a Goan, the rest were Indians. The monthly incidence was as follows :—2 in March, 3 in April, 1 in May, 3 in June, and 2 in August.

The fatal case was a striking example of the disastrous effects of transport or exertion of any kind on this disease. The patient was taken ill in the evening. During the night he got out of bed several times to get himself drinks and medicine.

Next morning a rickshaw was called, in which he made a journey of nearly two miles to hospital, walking from his home to the rickshaw and from the rickshaw into the hospital ward. He went rapidly from bad to worse and died after three days' illness. At the same time and in the same ward there was another case whose illness to start with seemed just as bad and, so far as one could judge, whose prospects were no better than those of the fatal case except that he had the good fortune to be in hospital when attacked. He had been admitted the day before suffering from subtertian malaria. This patient made a good recovery after three days of fever and port wine urine.

NOTES ON TWO FATAL CASES OF ANÆMIA OF PREGNANCY. BY DR. T. H. SUFFERN, M.B., B.A.O., CH.B. (ROYAL UNIVERSITY, IRELAND), SENIOR MEDICAL OFFICER, TABORA.

Two fatal cases of anæmia of pregnancy are of some interest. The following are brief notes :—

The first was an Indian woman, six months pregnant in her sixth pregnancy, admitted June 26th, 1928, giving a history of low fever 99° — 100° for over a month. No malaria parasites had been found and quinine had been given without effect. Her stools and sputum had been examined with negative results and her urine was free from albumen. On admission she presented the clinical picture of profound anæmia: weakness, breathlessness, pallor, subcutaneous œdema and hæmic murmurs. Blood examination gave the following results: The hæmoglobin was 30 per cent. and the total red cell count was approximately 800,000 per mm. A stained film showed a marked degree of anisocytoses and poikilocytoses, much polychromasia and numerous normoblasts and megaloblasts. The differential leucocyte count gave :—

Polymorphs	68·3	Mononuclears	10·3
Lymphocytes	21·1	Mast cells	0·3

The patient died 21st July, 1928. The ordinary hæmotic remedies had not the slightest effect. An attempt was made to feed her on liver soup, but failed owing to religious prejudice and a tendency to nausea and vomiting. This case was probably a pernicious anæmia of pregnancy.

The second case was a toxæmia of pregnancy in which a marked anæmia was a prominent feature. The patient was an Indian woman and, like the first, was six months pregnant in her sixth pregnancy. She was admitted to hospital on 8th July, 1928, giving a vague history of fever and vomiting for three weeks. On admission she was in a state of extreme weakness with a subnormal temperature and a pulse of 130. Her tongue was dry and furred. There was marked jaundice and the liver was enlarged and palpable below the costal margin. The urine contained a cloud of albumen. Hæmic murmurs were marked. A blood film showed much anisocytosis, poikilocytosis and polychromasia, also numerous normoblasts and megaloblasts. There were no parasites. The patient died on the 9th July, 1928, the day following admission. This was probably a secondary anæmia caused or aggravated by a toxæmia of pregnancy.

NOTES ON RARE CASES OF DISEASE. BY DR. C. L. IEVERS, L.R.C.P., L.R.C.S. (EDIN.), L.R.F.P.S. (GLAS.), D.T.M. (LIV.), SENIOR MEDICAL OFFICER, TANGA.

(1) An Indian infant was brought to hospital with cancrum oris, involving the upper and lower jaws and the mucous membrane of the left cheek.

The infant was brought to hospital daily and on four occasions under ether anæsthesia, the affected portions of mucous membrane were removed and the affected area thoroughly cleansed with Tinct. Iodi.

The parts of the upper and lower jaws, which contained the unerupted teeth, sloughed away; but eventually the infant recovered and is still living seven months after the onset of the disease.

(2) On the night of the 28th October, a Goan lady, aged 22 years, developed Schonlein's disease, which had an extraordinary acute onset (rigor, with subsequent rise of temperature to 107), and which presented the following symptoms:—

- (a) A purpuric rash over the arms, legs and abdomen.
- (b) Pain and swelling of the following joints (wrists, elbows, shoulders, knees, ankles, and interphalangeal).
- (c) Sore throat (which disappeared in two or three days).
- (d) Bullous eruption over the malleoli.
- (e) Albuminuria (a cloud at first, which disappeared in three or four days).

The general condition progressively improved and the above-mentioned signs disappeared—with the exception of the eye condition. The patient was admitted to hospital on 1st November and left on the 4th December, 1928, in order to prepare for the journey to Bombay.

The eye condition progressed as follows:—

- (a) From the beginning, the eyes were greatly affected, and there was an opaque exudation into the anterior chambers which deprived the patient of the power of telling darkness from light as early as the 28th October. On the 10th December, the patient was just able to tell darkness from light, but after a week, blindness became absolute, and remained so until she left hospital.
- (b) The cornea of both eyes became steamy, but subsequently cleared. This steami-ness, together with the exudation, prevented any observation of the pupils throughout her illness.
- (c) There were alterations in the intraocular tension. For the first ten days there was no increase in tension; afterwards, tension in the right eye was +, but this disappeared when the patient left hospital.
- (d) There was ciliary tenderness; and the circumcorneal congestion was very marked, the colour being purplish.
- (e) There were flakes behind each cornea, which were in great measure absorbed.
- (f) There were hæmatomata under the sclerotics (which, perhaps, accounted for the increased tension in the right eye). These were in great measure absorbed.

The treatment adopted was as follows:—

1. Calcium lactate was given for the first four days.
2. Atropine was instilled into the eyes for the first ten days.
3. Boracic fomentations were applied throughout.
4. After the first four days, Potass. Iodide (60 gr. daily), and Soda Bicarbonas (120 gr. daily) were given until the patient left hospital.

With respect to vision, the prognosis was bad from the beginning and remained bad throughout.

Malignant Diseases.—Four cases of malignant diseases were recorded during the year, a brief account of them is as follows:—

- (a) An elderly English lady, aged 76, was seen a few weeks before her death. She was suffering from a large mass in the abdomen, obviously malignant and inoperable, which was diagnosed as carcinoma of the stomach in a late stage. Jaundice, anæmia and cachexia were very marked.
- (b) A German male, aged 50, was treated palliatively in hospital for recurrent inoperable carcinoma of the rectum. He was invalided to Germany, where he subsequently died.
- (c) An African female, aged 47, was admitted to hospital with a large fungating tumour of the cervix and body of the uterus, the condition was inoperable—the bladder and rectum being implicated. A portion of the growth was sent to the laboratory at Dar-es-Salaam, where the tumour was diagnosed as being definitely a primary sarcoma of the uterus.

- (d) An African male, aged 49, was admitted to hospital with a large tumour of the bladder, which was quite inoperable. After death, a portion of the tumour was sent to the laboratory at Dar-es-Salaam, where the tumour was diagnosed as being a primary papilloma, on which malignancy (epitheliomatous) had supervened.

Tetanus.—During the year 1928, two cases of tetanus were treated in hospital; a brief report is as follows :—

- (a) During the month of February, an Indian patient was brought into hospital with tetanus—his jaws were “locked,” opisthotonus was present, and convulsive spasms were almost continuous. There was no evidence of a wound, but the patient was, of course, too ill to give any history. He died two days after admission from a very severe attack of tetanus.
- (b) During the month of April, an African labourer, who had fallen into a fire during a fit of epilepsy, came to hospital with gangrene of one leg and one hand, as a result of the very severe burns. His leg was amputated, but he developed tetanus and died. A prophylactic dose of antitetanic serum was given after the operation, but he developed tetanus within 12 hours of the operation. I feel sure that he contracted the disease outside the hospital, as when admitted, the bones of his leg were exposed and soiled with dirt. The attack of tetanus, in this case, was comparatively mild, but the jaws were firmly locked. He was in an almost dying condition when admitted to hospital.

Report on Cases of Beriberi during the year 1928.—Twenty-nine cases of beriberi were admitted during the year 1928, as compared with 16 during the previous year. Of these cases, all were African plantation labourers, except one Indian. All recovered, except the Indian patient and one African patient, after being treated with appropriate dietary for two months. The longest stay in hospital for this disease was four months.

The two fatal cases died as a result of syncope.

All the patients suffered from peripheral neuritis and paralysis of the muscles of the leg, but the Indian patient suffered from a similar condition of the muscles of the arm, in addition, and was almost completely paralysed when admitted to hospital.

Every case of beriberi was reported to the Senior Sanitation Officer and to the Labour Officer.

Report on Cases of Ulcer in Tanga Hospital during the year 1928.—Seventeen per cent. of the Native patients admitted to hospital during the year were admitted for the treatment of ulcers. I think this relatively large number is caused to some extent by the poisonous nature of the wounds caused by the spines of sisal plants among the thousands of labourers who work on sisal plantations, and when associated with the common concomitants of anæmia and under nourishment, ulcer can be a really incapacitating disease.

One always endeavours to find out and treat the primary disease, such as syphilis and yaws, of which the ulceration is the obvious result. I have often wondered whether a deficiency disease, of the nature of scurvy, may play a part in the causation of ulcer.

I have observed in tropical ulcers a fusiform bacillus and spirochæte, which appear to me to resemble morphologically the organisms in Vincent's Angina, but no scientific observations of any value were made during the past year, though I hope to go into the question more thoroughly during the present year.

I have great faith in the treatment, which I have reported upon in previous years : potassium iodide given internally, an hour later the ulcers being treated with gauze soaked in a solution of potassium permanganate, followed by sun treatment, and finally a dry dressing.

I have also great faith in skin grafting the large granulating surfaces, which hastens healing, and which breaks up the area—of what would otherwise become indurated scar tissue—and thus prevents subsequent breaking down.

NOTE ON A NERVOUS SYNDROME RESEMBLING DISSEMINATED SCLEROSIS FOLLOWING AN ATTACK OF RELAPSING FEVER. BY DR. C. F. SHELTON, M.D., L.R.C.P. (LOND.), M.R.C.S. (ENG.), B.S. (LOND.), D.T.M. & H. (LOND.), MEDICAL OFFICER, IRINGA.

H.C. German. Age 34.

History.—No past history of any affection of the nervous system. On the 29th January, 1928, while at Kidugalla, patient had an attack of "fever," accompanied by very severe headache and pains in the back and limbs. This attack lasted five days and was apparently uninfluenced by quinine. On recovery from this illness patient remained well until the 17th February, 1928, when he had a second attack of fever, the symptoms, however, not being so severe as on the first occasion. He was seen for the first time on the day following, when a blood film showed a moderately heavy infection with *Sp. duttoni*. Treatment was commenced with intravenous injections of novarsenobillon, five injections in all being given, the first three at intervals of five days, and the last two at intervals of a week. The dosage of the drug was 0·45, 0·45, 0·6, 0·6, and 0·75 grm. Except for attacks of photophobia and circumciliary injection, first in the right eye and then in the left, patient made a good recovery, and was able to resume his work early in March, being then in fairly good health except for the fact that he had slight weakness and difficulty in walking.

On the 19th March, 1928, I saw this patient again. He was now complaining of tremors of both hands, so marked that he could only sign his name with great difficulty, of stiffness and difficulty in walking, of difficulty in reading and of failure of vision in the left eye.

On examination.—There was very marked intention tremor of both hands, more noticeable on the right side than the left, accompanied by diminished power of co-ordination. The gait was spastic and unsteady, the knee jerks were exaggerated, more so on the left side than on the right. The plantar response on the left side was definitely extensor, and the abdominal reflex on this side was diminished. Fine tremor of the tongue was present, but there was no complaint of diplopia and no nystagmus. Speech was normal.

Eyes.—Right optic disc normal. The left disc could not be seen owing to a hæmorrhage into the vitreous.

Note on the 2nd April, 1928.—Gait much improved but still spastic. Knee jerks and abdominal reflexes normal and equal. An extensor plantar response was still present on the left side, but was elicited only on stimulation of the outer side of the sole. Tremor of hands still present, but much less marked; no tremor of the tongue. No change in the eye condition.

Note on the 25th April, 1928.—Gait nearly normal. Hands still slightly tremulous. Slight pallor of the temporal side of the left optic disc.

The patient returned to Germany early in May, 1928.

NOTE ON A CASE OF PARKINSON'S SYNDROME OCCURRING IN AN AFRICAN NATIVE. BY DR. C. F. SHELTON, M.D., L.R.C.P. (LOND.), M.R.C.S. (ENG.), B.S. (LOND.), D.T.M. & H. (LOND.), MEDICAL OFFICER, IRINGA.

Recent observations by Watson in the "China Medical Journal" of June, 1928, on "The origin of Encephalitis Lethargica" may make this case worthy of record.

The patient was an African male, aged about 30, and a native of Songea district.

History.—Soon after the end of the War, early in 1919, and while in the Songea region, he stated he had a severe attack of "fever," on recovering from which his present condition gradually developed.

On Examination.—Expression fixed and mournful, neck held stiffly, the head being turned slowly and with difficulty. Trunk rigid and bent forwards. Gait festinating

and with a marked tendency to overrunning, the slightest inequality in the ground causing the patient to fall forwards. Well-marked fluttering of the eyelids on attempt at closure. Ocular muscles normal, discs normal, no nystagmus, no complaint of diplopia.

There was considerable rigidity of both upper and lower extremities. The arms were held away from the trunk and were the seat of constant rhythmical tremors—most marked in the forearms where there was a persistent pronator-supinator movement, tremor of a “pill-rolling” type being also present in the hands. Tremors were present but less noticeable in the lower extremities, where they were of the nature of flexor movements at the knee-joints. The movements ceased during sleep and were greatly aggravated by any attempt at voluntary movement.

No objective sensory changes were present, the K.Js. were equal and normal, the plantar response flexor and the abdominal reflexes normal. C.S.F. clear and not under any abnormal pressure.

This case was under observation in hospital for over four months, during which time the condition appeared to be slowly progressive.

Treatment (including injections of bismuth) had no influence on his symptoms and eventually he was discharged to his home at his own request.

Remarks.

1. Clinically this appeared to be a very definite case of Parkinsonism.
2. The attack of “fever,” after which his present condition developed, might very well have been the febrile stage of Encephalitis Lethargica.
3. I have been informed that no definite cases of Encephalitis Lethargica have ever been notified in the Territory.
4. It has been suggested that the above condition might be due to the after effects of cerebro-spinal fever, a disease which was common in the Territory during and immediately after the War. So far as I know, Parkinson’s Syndrome has never been described as a sequela of cerebro-spinal fever.

AN ACCOUNT OF TEN CASES OF ABNORMAL LABOUR OCCURRING IN AFRICAN WOMEN. BY DR. C. F. SHELTON, M.D., L.R.C.P. (LOND.), M.R.C.S. (ENG.), B.S. (LOND.), D.T.M. & H. (LOND.), MEDICAL OFFICER, IRINGA.

I propose, firstly, to give short notes of each case treated and, secondly, to make some brief remarks on the subject of maternal mortality amongst the Native.

All the cases described were treated in the Native Hospital, Iringa.

CASE 1.—Obstructed labour: Patient—a primipara—was admitted on the third day after labour had commenced. Pulse 130. Temp. 100. Tongue dry. Bladder distended to 1 inch above the umbilicus. Uterus contracting strongly, but not relaxing completely between pains. No contraction ring felt. Head low and firmly fixed in the pelvis—so much so that it was found impossible to pass a catheter, and a suprapubic puncture was required. Foetal heart sounds not heard. Under full anæsthesia craniotomy was performed and the child extracted. The mother made a good recovery.

Cause of Obstruction.—Post-maturity of foetus, with moderate contraction of pelvis, which was of the generally contracted type.

CASE 2.—A primipara, admitted to hospital early in the second stage of labour. Twin pregnancy, both children presenting by the vertex. Delivery was effected normally, but the birth of the second child was followed by a rather severe post-partum hæmorrhage, the hæmorrhage, however, responding well to ordinary routine treatment.

The mother made an uneventful recovery, and both children were alive and in good condition when discharged from hospital.

This case, I consider, would in all probability have died had she been left to the care of Native midwives.

CASE 3.—A breech with extended legs. Patient, a primipara. The duration of labour on admission to hospital was uncertain, but the child was already dead and partially macerated when the case was first seen. Maternal pulse 120. Temp. 101. Bladder distended to the umbilicus. Uterus contracting well and relaxing between the pains. Under general anæsthesia a leg was brought down and delivery effected without much difficulty. The fœtus was premature—gestation having terminated at about the 36th week.

The mother made a satisfactory recovery.

CASE 4.—Patient, a primipara, was admitted to hospital after completion of the second stage of labour, the placenta being retained in the uterus. She had obviously had fairly severe hæmorrhage previous to admission, and the placenta, which was partially separated, was removed manually.

Recovery uneventful.

CASE 5.—This case, a 3 para, was admitted to hospital one evening in a moribund condition, and died a quarter of an hour after admission.

Duration of labour was uncertain, but the history given was that about an hour before being brought to hospital the deceased had been delivered normally of a dead full-term child, shortly after which she had become very ill and collapsed. No history of any internal manipulation having been attempted could be obtained, and the placenta had not been expelled.

A post-mortem examination showed a rupture of the lower uterine segment on the right side, the placenta having been expelled into the right broad ligament, which was also greatly distended by an enormous hæmatoma. No free blood was present in the general peritoneal cavity.

CASE 6.—This case, a primipara, with a vertex presentation, was admitted to hospital early in the first stage of labour. In spite of strong pains she showed very slow dilatation of the os, which, after 48 hours, was barely half dilated. Although the membranes were still unruptured, marked signs of maternal and fœtal distress were by now apparent, *i.e.*, maternal pulse was 125–130 between the pains, the fœtal heart sounds had slowed to 100, and, after rupture of the membranes, it was found that meconium had been passed.

Treatment.—Under general anæsthesia the membranes were ruptured and dilatation of the cervix was completed manually, followed by forceps delivery. The child, which was evidently premature, was born alive, but died four days after delivery.

CASE 7.—Admitted to hospital with retention of placenta, after completion of the second stage of labour. A very difficult manual removal was performed, the placenta being firmly adherent, and requiring to be removed piecemeal. From the condition of the vagina and cord I think it is probable that attempts at removal of the placenta had been made prior to admission. Beyond slight pyrexia for the first four days after operation recovery was uneventful.

CASE 8.—This case, a 2 para, was admitted on the third day of labour. Her appearance did not suggest any recent severe hæmorrhage, but she was in a very exhausted condition, and the uterus was commencing to show signs of tonic contraction. On vaginal examination a central placenta prævia was found, the os being fully dilated and the head well engaged.

After relaxation of the uterus had been obtained under full anæsthesia, the placenta was partly separated and pushed to one side, forceps applied to the head, and extraction very slowly carried out. The child, which was dead on delivery, was normal in weight and measurements. Manipulation of the placenta, prior to application of forceps, was unaccompanied by any bleeding, the placental vessels apparently having been almost

completely obliterated and thrombosed. The mother was discharged from hospital at her own request on the eighth day after delivery and was then in fairly satisfactory condition.

Note.—This case is interesting as showing Nature's method of dealing with such a condition, *i.e.*, strong pains, early dilation of the os, compression of the placental site by the presenting part, expulsion of the placenta followed by that of the child. As late as 1860 the treatment advised for a central placenta prævia followed these lines—namely, manual dilatation of the os if not already fully dilated. Separation and removal of the placenta, followed by immediate extraction of the child. In the case under review the uterine contractions pressing the head on the placental site had evidently brought about almost entire occlusion of the blood-vessels. Ultimately, however, the uterus had tired and had failed to complete delivery of placenta and child.

CASE 9.—Patient, a primipara, was admitted in a very exhausted condition. The pulse was 120. The temperature 100. The tongue parched and brown, and the vulva hot and dry. The uterus was relaxing well between the pains, which were strong and frequent, the foetal heart sounds were not heard, and the bladder was distended up to the umbilicus. On vaginal examination the head was low in the pelvis—the foetal scalp being visible at the vulva. Under general anæsthesia forceps delivery of a dead child was performed without any difficulty.

Death of the mother from septicæmia occurred on the seventh day after delivery.

This case had a rigor with a rise of temperature to 105° two hours after delivery and I think the probability is that she was already infected before admission. Before death a large part of the anterior vaginal wall sloughed with consequent formation of a vesico-vaginal fistula—this complication being almost certainly due to prolonged compression of the soft parts between the head and the symphysis pubis.

The total duration of labour was uncertain, but the second stage had probably lasted about 24 hours before admission to hospital.

CASE 10.—Patient, a primipara, was admitted on the third day of labour in a very exhausted and toxic condition. The os was fully dilated and the membranes ruptured, presentation a vertex. Foetal heart sounds not heard. Marked disproportion between the pelvis and the foetal head existed—the latter being high above the brim, while the uterus showed definite signs of tonic contraction. Under full anæsthesia a tentative attempt to perforate was made. The disproportion, however, was so marked and the uterus was so irritable that I feared that any further attempts at internal manipulation would probably lead to a uterus rupture. Rather than let the patient die undelivered it was decided to perform a Cæsarean Section, which was carried out without any difficulty. It is interesting to note that although the placenta was attached to the anterior uterine wall the contraction of the uterus was so marked that there was practically no bleeding from the placental site at the time of operation.

The uterus was unruptured. Death occurred 36 hours after operation.

Remarks.—The number of cases described (ten) is admittedly a very small one, and it may be argued that no conclusions can be drawn from such a small series. As against this it must be pointed out that these cases were all drawn from a fairly representative section of the population of the district, *i.e.*, the patients came from a small country town and from the surrounding country for a radius of about three miles. These women were nearly all from the poorer type of Native family, used to doing all their own house work, carrying wood and water, working in shambas, and generally living the ordinary life of a Native in an up-country district. They were not drawn from the better-to-do type of Swahili family—the type who live in the larger towns and in which the women do little or no work, take little exercise, and tend to live generally an easy life.

Further, when it is considered that these cases were drawn from a population of not more than 4,000, it would appear the number of difficult cases met with was unduly large, even allowing for the fact that none of the patients had had the benefit of any ante-natal

care or supervision. I very much doubt if a practitioner, working in an English country district, and drawing his patients from a population of the same size, could have met with ten such abnormal cases in the course of a year's work. Moreover, I feel sure that the cases which actually came under my observation during the year by no means comprised all the obstetrical disasters and deaths in child-birth which occurred in Iringa and its vicinity during the same period.

The latest edition of "Queen Charlotte's Practice of Midwifery" gives the following figures for the maternal death-rate in child-birth in various European countries.

	per 1,000.		per 1,000.
Scotland	5.70	Germany	3.49
Spain	5.27	Norway	2.90
Switzerland	5.21	Italy	2.44
France	4.78	Sweden	2.42
England and Wales ..	3.94	Holland	2.29

No reliable statistics exist as to the average mortality from this cause amongst African women. If, however, the cases described above are, as I believe them to be, a fair instance of the proportion of abnormal cases met with in practice amongst the local population, it would appear that the death-rate from child-birth amongst Native women must be considerably higher than in European countries.

REPORT ON AN OUTBREAK OF BUBONIC PLAGUE IN THE LULA AND OKOKOTO AREA OF THE IRINGA DISTRICT. By DR. C. F. SHELTON, M.D., L.R.C.P. (Lond.), M.R.C.S. (ENG.), B.S. (LOND.), D.T.M. & H. (LOND.), MEDICAL OFFICER, IRINGA.

1. *Bubonic Plague*.—During the month of February four fatal cases of what, from the description given, undoubtedly appeared to be bubonic plague, were reported from the districts of Lula and Okokoto, situated about 30 miles from Iringa on the Iringa-Kilosa road. Although none of these cases were seen by the Medical Officer, one case was seen shortly after death by Compounder Karpal, who had been sent to Okokoto on plague duty. A smear taken from the bubo showed doubtful gram negative bipolar staining bacilli, and I think there can be very little doubt that the deaths reported were due to bubonic plague.

2. Image, where plague was reported in 1920, is distant only about 10 miles from the village of Okokoto; from the above it would appear that a reservoir of infection exists in this part of the country. Preventive measures taken were :—

- (a) Rat destruction.
- (b) Inoculations of as many contacts and inhabitants of the infected area as possible.
- (c) Picketing of the main road passing through the infected district, travellers being collected in batches and marched through under escort in one day without being allowed to enter any Native huts on the way.
- (d) Establishment of a quarantine post outside Iringa at which all travellers from the Kilosa road were detained and examined before being allowed to continue their journey.

In September, owing to reports of numerous cases of sickness having occurred amongst shamba labourers in the Mufindi District (situated about 80 miles from Iringa), Native Dresser Mohamedi was sent to the district in question to obtain further particulars. On his return Dresser Mohamedi stated that he found no epidemic of sickness amongst Natives at Mufindi, but reported the fact that four Natives had died before his arrival with symptoms suggestive of bubonic plague, viz., fever, prostration, and swellings in the groin and armpits. No further cases of this nature have been reported from the Mufindi area.

NOTE ON A CASE OF HÆMATOCOLPOS, DUE TO IMPERFORATE HYMEN, OCCURRING IN AN AFRICAN GIRL. BY DR. C. F. SHELTON, M.D., L.R.C.P. (LOND.), M.R.C.S. (ENG.), B.S. (LOND.), D.T.M. & H. (LOND.), MEDICAL OFFICER, IRINGA.

Patient, a girl of about 14, was admitted to hospital with a history of abdominal pain and retention of urine, these symptoms being of 18 hours' duration. On enquiry it was found that the patient had never menstruated. Apart from this she stated that she had been quite well up to the time of onset of the present condition, and had noticed nothing wrong with her abdomen.

On examination.—The patient was well nourished and well developed for her age.

Abdomen.—There was a tense elastic dome-shaped swelling arising from the pelvis and extending upwards to within $1\frac{1}{2}$ inches of the ensiform cartilage. The bladder was distended to within 1 inch of the umbilicus.

External genitalia.—The vaginal orifice was completely closed by a tense, membranous diaphragm; otherwise the external genitalia were normal.

Treatment.—A catheter was passed with some difficulty and 25 ounces of urine drawn off. Under general anæsthesia the hymen was incised and the edges trimmed. The hæmatocolpos fluid was thin and chocolate coloured, and flowed readily. The fallopian tubes were not enlarged. Recovery was uneventful.

A CASE OF BLACKWATER IN AN AFRICAN NATIVE. BY DR. R. C. SPEIRS, M.B., Ch.B. (EDIN.), MEDICAL OFFICER, ARUSHA.

Male native, aged about 12 years, Mchagga, born at Mashame, near Moshi, was admitted to hospital on the 19th December, 1928.

The body looked distressed, had a temperature of 100° F., and was jaundiced. Soon after admission he passed a quantity of typical blackwater urine.

The patient stated that he had lived at Mashame all his life, with the exception of occasional visits to Moshi. He had two attacks of fever previously, one about a year ago and one about two years before. Otherwise he had had no other illness.

On this occasion on arrival in Arusha he had a sharp attack of "fever." He was given a tablet of quinine by a European, on whose farm he was staying, on the 15th December, 1928; two tablets of quinine on the morning of the 16th December, 1928; and one tablet on the evening of the 17th December, 1928. He first noticed that he was passing dark urine on the morning of the 17th December, 1928. His blood on admission showed no malarial parasites and the differential count was:—

	Per cent.		Per cent.
Polymorphonuclears ..	70	Mononuclears ..	8
Lymphocysts	21	Eosinophyls	1

There was some polychromasia. The urine passed on the first day of admission was examined:—

Colour.—Dark Port Wine.

Reaction.—Acid.

S.G.—1025.

Deposit.—Colour, Reddish Brown. Amount about one-fifth total quantity of urine. Hyaline casts were present.

Albumin.—* * *.

The urine passed on the second day was similar to the above, except that there was less deposit and the colour had changed to dark red.

The urine cleared up four days after admission. He had no suppression of urine, and, although he vomited irregularly, this did not prevent him retaining a sufficient amount of fluid. He was treated in the usual manner with alkaline drinks, etc.

This case is of some interest in that African Natives as a rule seem to be immune from blackwater fever. Mashame, where this boy had resided all his life, is, I believe, a cool and more or less mosquito-free locality, which approximates it to a European climate. It is a place where one would not be liable to constant reinfections of malaria.

The fact that he had been given quinine a short time before the onset of the blackwater is also of interest.

THE TREATMENT OF EPILEPSY BY INTRA-MUSCULAR INJECTIONS OF BISMUTH SODIUM TARTRATE. BY DR. D. V. LATHAM, B.A., M.B., Ch.B., B.A.O. (DUB.), MEDICAL OFFICER, KILOSA.

Further to two cases so treated at Lushoto in 1926 and reported in the Annual Report of that year, five cases were treated here this year.

Case No. 1, daily fits, major epilepsy, after eight bi-weekly injections of 2 gr., free from fits for 10 days; discharged, and lost sight of.

Case No. 2, having major fits twice a week on an average, 10 bi-weekly injections of 2 gr., reported two mild fits in three months after treatment.

Case No. 3, major fits two or three times a week, treated by bi-weekly injections of 2 gr. for four weeks. No improvement; refused further treatment.

Case No. 4, having mild fits about once a week, treated by bi-weekly injections for two weeks. Reported no further fits in two months.

Case No. 5, bi-weekly fits of major epilepsy, injections of 2 gr. twice a week for three weeks. Fits increased in frequency and severity. Treatment discontinued; no benefit whatever.

It is possible that the cases responding to this treatment had positive Wassermann reaction, but facilities for carrying out this test do not exist at Kilosa. It would be instructive to treat a series of cases in which the Wassermann reaction had been previously ascertained.

NOTES ON (a) THE ETIOLOGY OF YAWS AMONGST THE WAHA TRIBE OF TANGANYIKA TERRITORY, AND (b) A CASE OF MULTIPLE DEFORMITY IN AN ADULT NATIVE. BY DR. C. R. STEEL, M.R.C.S. (ENG.), L.R.C.P. (LOND.), D.T.M. & H. (LOND.), MEDICAL OFFICER, KIGOMA.

(a) *The Etiology of Yaws amongst the Waha Tribe of Tanganyika Territory.*

References to yaws etiology are not frequent if we omit the volumes which have been written on the relation of yaws to syphilis and goundou. Beyond this little progress seems to have been made, and this is the apology for this short note, which may help to direct some further attention to a lacuna which surely needs lessening.

In Vol. 2 of Byam and Archibald's work direct transference from the sick to the healthy by direct contact is stressed, and it is noted that flies have been proved experimentally to be capable of transmitting the disease. It is stated that the germ cannot pass through the unbroken skin and an abrasion must be present. Macleod, in his "Diseases of the Skin," notes the highly contagious nature of the infection, and considers transference takes place directly through an abrasion of the skin, or indirectly by contact with contaminated articles, or by transmission by some biting insect. He states, "The possibility of the fly being a carrier has attracted considerable attention lately." Brumpt, in "Précis de Parasitologie" (1927), states that transmission of the parasite is usually made by intimate extra-genital contact, frequently a child infecting the mother when she is not protected by a prior infection. He also notes that flies appear to play a certain rôle in diffusion. J. Hylton Pasqual, in the "Transactions of the Royal Society of Tropical Medicine and Hygiene," No. 1 of volume 22, page 59, in stating the belief that a certain

community is yaws-free, says: "The explanation suggests itself that these people, because of their isolation and agrarian habits, had not yet been infected from outside sources; for all the factors which are accepted as inducing the distribution of yaws (with the possible exception of spatial overcrowding) they had with them—dirt, insanitary habits and customs, ecto-parasites, flies."

The Waha live in that northern portion of Kigoma Province, Tanganyika Territory, which has an average height of 5,100 to 5,800 feet and consists of open grass-lands and wooded valleys. The temperature of the highlands of this country averages a maximum of 29° C. and a minimum of 14·4° C., and has an average rainfall of 52 inches.

The occupation of the people is the keeping of stock and agriculture, and they wear a single partly cured skin or a bark-cloth garment. Their huts are beehive in shape and are not well grouped, but scattered about wherever their occupation leads them. Their diet is of milk, meat, and such local products as maize, millet, sweet potatoes and cassava root. Their general habits and morals are primitive. These people supply the bulk of the cases of yaws seen at Kigoma Hospital, and in 1928 only 1 per cent. of male cases seen were amongst Native officials, who mostly live close to Kigoma, and are comparatively cleanly, well housed and well fed. In 1926, of 927 cases of yaws, only 25 were officials. In 1927, of the official patients seen for all diseases, only 4·4 per cent. had yaws, whilst 53·9 per cent. of the non-officials had yaws. A preponderance of yaws amongst the Native cases is seen owing to their confidence in the treatment, but, on the other hand, yaws appearing in an official is not likely to pass unrecorded. One is certainly impressed here, as also in previous experience in the Native Hospital at Dar-es-Salaam, by the relative absence of yaws amongst well-housed and well-fed official patients as compared to Natives of rural communities. Why should this be? Police and soldiers live under more hygienic conditions than other Natives, but otherwise the Native official is as much exposed to ecto-parasites as the non-official. His domicile is usually more urban, under the supervision of European sanitary staff, and consequently the fly nuisance is not so acute. Owing to regular employment, which means more regular wages and food, they are in better physical condition.

With the Waha, the fly might well be an important factor as they abound in and around their dwelling. Except for the efforts of travelling Medical and Administrative Staff, the tribal sanitation is very primitive, and their dwellings are tick-infested. A group of their chief men in a discussion on yaws gave as their belief that transmission is venereal if one or other partner has a secondary rash; also that it can be inherited and passed either way in breast-feeding. The possibility of fly transmission is allowed by them, and considered likely from the discharging ulcers of the tertiary stage. In this case they think the recipient must have an abrasion of the skin through which the disease can enter. Transmission by bed-bugs, of which they have intimate knowledge, is disputed, but allowed by some. Transmission by mosquito bite is not supported.

Twenty-five patients of this tribe, chosen only because they exhibited typical secondary yaws rash, were examined and questioned. None presented the typical mother yaws of the text-books, and only one of the several thousand cases seen here and on the coast is remembered as showing anything like the described appearance of a mother yaw. Several times yaws on the penis or scrotum has been observed without lesions on the rest of the body, but a corresponding condition has not been seen in the female. The ages of the 25 cases noted varied from an infant of 10 months to a man of 35 years. All those of adolescence and older gave their occupation as either cultivation or pastoral.

Fifteen of these cases stated that previously to noticing the rash on their bodies they had had an ulcer on some part of the body. These ulcers were stated to be the result of injuries by sticks and falls, and the abrasions were then worried by flies and sepsis set in. In all the 15 cases the newish scar of the ulceration was exhibited, and in one case was thickly clustered with yaws. One ulcer was on the buttock and one on the elbow, and the remainder were leg ulcers. The shortest time given as elapsing between the appearance of the ulcer and that of the yaws rash was one month, and the longest four months, whilst the average time was 2·18 months.

Three men blamed their wives for giving them the infection. One of these gave no time relative to the appearance of the rash, and had no rash or other lesion of the genitals. Another gave five months for the elapsed time between the time of his wife getting a yaws rash and his getting it. He stated that his wife had an injury to the skin of the leg before she got her yaws rash. He first noticed a sore on the prepuce, which at the time of examination was soft, had a white base and raised white edges, and was moist. In addition, of course, he had a typical secondary yaws rash on other parts of the body. The other case of this type had noticed the rash on his wife, and he refrained from coitus with her for six months. Then, thinking she was cured, he resumed relations with her, and three months afterwards he developed a similar rash.

Two men and one woman blamed their partners in illicit intercourse for giving them the infection. The woman gave one month as the period between the act and the appearance of the rash. One of the two men gave three months for the period, and the other eight days.

One woman said her baby had an ulcer and later a yaws rash, that she was suckling the child and that she also got a rash three months after the appearance of the baby's, and that hers first appeared on the nipples.

A baby brought by a woman was said to have been infected by the mother who was suckling it. The mother had an ulcer of the ankle, and four months afterwards she got a yaws rash, which appeared first on the hands. At the time she was sharing food with a child who had got a rash.

The remaining two cases could give no explanation of how they got yaws, except that others in their hut also had it. One was a man sharing a hut with five people, and the other was a young girl who habitually shared a bed with a young brother who had a yaws rash previously to her developing one. She said that at the time of examination her brother had been suffering from the rash for two months and she herself for one month.

The result of these examinations of patients are very interesting, and one was struck with the definite way in which patients gave their beliefs in the cause of their infection. Of the 25 cases only nine gave no history of family or other intimate contact with other cases of yaws; of the 16 giving such history, 13 had contact with secondary yaws cases, whilst the other three had parents who had had yaws several years before.

Should the examination of larger numbers than in this small series confirm the observations, the question would arise as to whether a treatment campaign goes far enough and whether it should not include immediate isolation of cases until the secondary stage is over, and also special units to seek out and treat "ulcers." Certainly, further emphasis should be laid on the highly contagious nature of the infection.

(b) A Case of Multiple Deformity in an Adult Native.

The case was a member of the Wajiji tribe of Kigoma Province, of Tanganyika Territory, aged about thirty years, and was seen at Kigoma in December of 1927. It is of interest as showing that such gross malformation is compatible with power to walk well and to be able to grip well with both hands, so that the patient was able to lead an active life and to earn his living.

The upper lip was split, but the palate was intact. In the right hand, the distal joint of the thumb was in a position of flexion. Only two metacarpals could be felt in the palm, that corresponding to the second being double in part of its length. They each bore a carpal bone, but there was no division of the skin, so that there was only one large finger, bearing a double nail. This finger had some flexion deformity. There was a very good grip with this hand.

On the left hand there was no thumb, and the second metacarpal was only half formed. The third was represented by a bar of bone joining the second to the end of the fourth. Otherwise, the fourth and fifth metacarpals seemed normal, and the only fingers present were the fourth and fifth, which were partly webbed. There was a good grip with this hand also, not so good as with the right.

Each foot bore two appendages. On the right foot, the outer appendage formed the greater part of the foot, and seemed to contain a metatarsal bone, ending in a small, fleshy stump bearing a nail. The inner appendage of the right foot contained two tarsal bones, was hooked, and bore no nail.

The left foot was divided into two almost equal parts, the outer part being slightly the larger, and bearing a small fleshy toe, having a nail. The individual bones of neither mass could be felt. The inner mass was crooked upwards and inwards, and bore a nailless toe containing two tarsal bones. With a flat-footed gait, the patient could walk quite well.



Photograph of the case described above.

A NOTE ON THE TREATMENT OF YAWS WITH BISMUTH ARSANILATE. BY DR. W. K. CONNELL, M.B., CH.B. (GLAS.), F.R.C.S. (ENG.), AND DR. T. LANGAN, M.B., CH.B., B.A.O. (DUB.), MEDICAL OFFICERS, SEWA HADJI HOSPITAL, DAR-ES-SALAAM.

On the 5th December, 1928, we received from Dr. Shircore, Director of Medical and Sanitary Services, Tanganyika Territory, a batch of "sterules" prepared by Martindale, each containing three gr. of Bismuth Arsanilate suspended in oil, and we were instructed to test the action of this preparation on a few typical cases of yaws. This we endeavoured to do, to the best of our ability, though we were considerably handicapped by the unaccommodating capacity of our African patients. Partly because of this apathy, and partly because of the strictly limited supply of the new drug, we were able to treat only seven cases. Of these, one failed to return after the first injection. Another displayed such "cussedness" that no attempt was made to secure samples of his blood for serological examination. A third absconded before the full series of injections aimed at (viz., six) could be given; so that the effect of treatment on his Wassermann and Kahn reactions remains unknown. The remaining four cases were all serologically tested "before and after."

The results may be summarized as follows :—

Of the six cases which received a course of injections, five were completely cured clinically on an average of 26·8 days from the commencement of treatment, each case having had an average of five 3-gr. injections.

The sixth case absconded before treatment was completed, but he was progressing favourably, his skin eruption having almost disappeared ten days from the start of treatment, three 3-gr. injections having been given.

The four cases which were serologically examined "before and after," were *all* Wassermann-negative as tested on an average of 74·25 days from the start of treatment, each having had an average of six 3-gr. injections. Three of these cases were also Kahn-negative, while one was $K \pm$. In each case an average of 52·25 days intervened between the sixth injection and the negative serological tests. Except in Case II, there was an appreciable interval between the conclusion of active treatment and the development of a negative change in the blood reactions. Thus, Cases I and IV were still positive seven days, and Case III two days after the sixth injection.

The Wassermann and Kahn tests were kindly performed by Dr. Burke-Gaffney at the Dar-es-Salaam laboratory.

It is interesting to compare the foregoing with Carman's results of yaws-treatment by potassium-sodium-bismuth-tartrate (reported in "The Kenya and East African Medical Journal" of October, 1928). Carman found that an average of ten injections was necessary to secure the complete healing of all lesions, and that nearly 60 per cent. of his cases still showed a positive W.R. even after twelve injections.

Not a single complication was observed as the result of our bismuth arsanilate injections. The patients assured us that no pain was experienced during the injections; nor were these followed by any untoward symptoms, either local or general. There was an entire absence of stomatitis, and of local pain or induration.

Our findings are inevitably open to the criticism that the efficacy of a drug cannot be judged by its action on a mere handful of cases, and this communication is to be regarded only as a preliminary note. At the same time, we consider the results of these early observations to be highly encouraging.

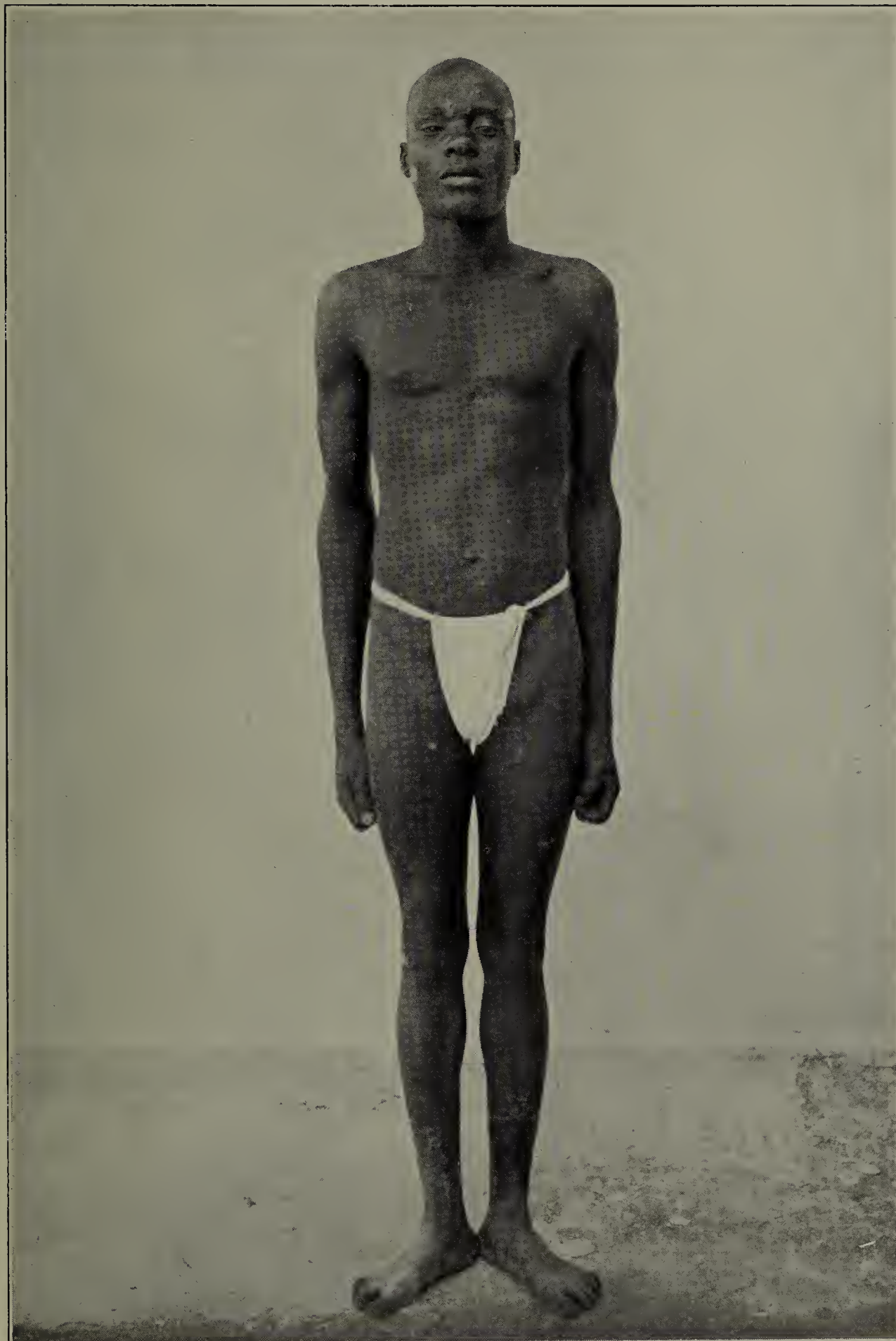
Case.	Name, etc.	Age.	History.	Condition when first seen.	Details of Injections.	Progress of Case.	Serological Tests.	General Remarks.
I.	Fidelis bin Chiyai-Chako. K.A.R. askari. First seen on 2.1.29.	32	Disease started on 10.12.28 with appearance of a single crust over right eyebrow. This was followed, 24 hours later, by the generalized eruption.	About 20 typical yaws crusts on front of face; numerous crusts on buttocks, thighs and front of legs. Scattered crusts on back of arms and on front and back of trunk.	2.1.29.—Gr. iii. No pain 4.1.29.—" No ill effects. 7.1.29.—" " 10.1.29.—" " 14.1.29.—" " Slight swelling at site of last injection.	4.1.29.—Crusts on thighs and buttocks only have begun to dry up. 10.1.29.—Crusts on face almost gone; represented only by bluish spots flush with skin. 14.1.29.—Rash completely gone. Only the bluish staining left. Feels perfectly fit. 17.1.29.— Completely cured clinically. Only a little black pigmentation left. 11.3.29.—No evidence of relapse.	4.1.29.—W.R. + ± K. + + + 24.1.29.—W.R. + + K. + + + + 11.3.29.—W.R.O. K. ±	A clinical cure was obtained 12 days after start of treatment, patient having received four injections, totalling 12 grs. of Bismuth Arsanilate. Patient was serologically negative 68 days after start of treatment, having received a total of six injections, amounting to 18 gr. of the drug.
II.	Mohamed Mpiuda. Mhche tribe. Town 'Sapi's. First seen on 4.1.29.	30	Disease started at about the end of November, i.e., a month previous to his appearance at this hospital. It commenced with a sensation of itchiness over the face and trunk, and this was quickly followed by the appearance of a sore on middle of right leg. A few days later, the generalized yaws eruption appeared. For this he received a single injection of "B.S.T." at Pangani, but this did not cause the eruption to disappear.	A scattered, but not very profused, eruption of typical yaws crusts on face and on trunk of body, the eruption being most marked on the back. In addition, there was a lesion like a large chronic boil on the middle of the right leg; this seems to have been the initial yaws lesion in this case. Marked osteocopic pains. General glandular enlargement.	From the 4th till the 8th January, patient received daily gr. i of Bismuth Arsanilate by mouth, i.e., 5 gr. in all. As this treatment produced no apparent result, the drug was thereafter given by injection as follows:— 10.1.29.—Gr. iii. No pain 14.1.29.—" " effects. 18.1.29.—" " 24.1.29.—" " 28.1.29.—" " 1.2.29.—" " 4.3.29.—" " 9.3.29.—" "	14.1.29.— Osteocopic pains gone. No change in eruption. 18.1.29.—Very obvious shrinkage and drying of all crusts. Feels very fit. 24.1.29.—Crusts now very dark in colour and almost flush with surface. 28.1.29.— " Primary Yaw " on leg bealed, except for small scab. 1.2.29.—Face quite clear, but crusts on back still not completely separated. 6.2.29.—Threc or four crusts on back still not completely separated. 4.3.29.— " Primary Yaw " on leg broken out again. Yaws eruption completely gone; only dark pigmentation left. 9.3.29.— " Primary Yaw " much smaller. 9.4.29.—All lesions completely healed. Dark pigmentation remains.	4.1.29.—W.R. + + K. + + + + 6.2.29.—W.R.O. K.O. 9.3.29.—W.R.O. K.O.	This case is slightly complicated by the fact that it received one "R.S.T." injection just over one month before Bismuth Arsanilate was exhibited; also by the fact that 5 gr. of Bismuth Arsanilate were given orally before injections were begun. The case was serologically negative 33 days after starting treatment, though the yaws crusts had not completely separated by then. Fifty-nine days from start of treatment, the "Primary Yaw" appeared to become active again; two further injections were given, and the "Primary Yaw" soon disappeared. Altogether, patient got 34 gr. Bismuth Arsanilate in the course of eight injections; also 5 gr. of the drug orally; 18 gr. by injection and 5 orally had been given by the time the second serological test (which proved negative) was done.

III.	<p>45</p> <p>Salehe bin Kitam-buliya. Ndengeleko tribe. Town Mbesi. First seen on 11.1.29.</p>	<p>Disease begun about two months ago, with a sore on the glans penis. About three weeks later, a generalized, crusty eruption broke out all over the body.</p>	<p>Whole penis congested, with an ulcer on the neutral aspect of the glans, spreading dorsally in sulcus behind corona, and exposing the Corpus Spongiosum. Very copious and apparently quite typical yaws crusts on face, back of trunk, extensor aspect of arms and legs, and axilla.</p> <p>A number of small, soft, confluent crusts around the nares and beneath the lower lip are suggestive of syphilis, as are also some fissures at the corners of the mouth.</p> <p>Osteoepic pains. Deep-seated pain in ankle joints. General glandular enlargement.</p> <p>It is difficult to be quite certain whether this is a case of yaws, or of syphilis, or of a mixed infection.</p>	<p>11.1.29.—Gr. iii. No pain 15.1.29.—Gr. iii. No ill effects. 24.1.29.—" " 28.1.29.—" " 1.2.29.—" " 4.2.29.—" "</p>	<p>15.1.29.—Osteoepic pains gone. No effect on rash or penile ulcer. 24.1.29.—Ulcer on penis almost healed. Rash completely disappeared, except in armpits, where it is dark in colour and almost flush with surface. 28.1.29.—Nothing now left but spots of black pigmentation, and a great many of these have by now disappeared. 1.2.29.—Ulceration of penis still not completely healed. 4.2.29.—Penile ulceration practically disappeared. 14.5.29.—Still quite cured clinically. Pigmarks still remain.</p>	<p>11.1.29.—W.R. + + K. + + + 6.2.29.—W.R. + + K. + + + + 14.5.29.—W.R.O. K.O.</p>	<p>The generalized eruption was cured 17 days after start of treatment, patient having received three injections of Bismuth Arsanilate, totalling 9 gr. 24 days after start of treatment, the penile ulceration also was practically cured, patient having received five injections, totalling 15 gr. Patient was serologically negative as tested 123 days from start of treatment and 99 days from the date of the last injection.</p>
IV.	<p>25</p> <p>Asha binti Sefu. Mkani Tribe. Town Ubungo. First seen on 19.2.29.</p>	<p>About three weeks ago patient developed a chigger lesion on back of right heel. This was followed, a few days later, by the generalized eruption.</p>	<p>Fairly plastered from head to toe with an extensive eruption of typical yaws crusts. A large, yellow crust was seen around a small ulcer (of about shilling size) on back of right heel; this was presumably the "Primary Yaw."</p> <p>Slight general glandular enlargement.</p>	<p>19.2.29.—Gr. iii. No pain 26.2.29.—Gr. iii. No ill effects. 1.3.29.—" " 5.3.29.—" " 8.3.29.—" " 12.3.29.—" "</p>	<p>26.2.29.—"Primary Yaw" almost healed. Very little change in eruptions. 1.3.29.—Crusts slowly drying up. "Primary Yaw" healed. 5.3.29.—Very many crusts have now separated, leaving only areas of black pigmentation. 8.3.29.—All lesions black, dry and flush with surface, except for a few crusts on chin. 12.3.29.—Almost cured. All crusts dry and black, except for three crusts on chin. 19.3.29.—A few crusts, though dry, not yet absolutely separated. 2.4.29.—All lesions now completely healed. Every crust separated, but black staining remains. 3.5.29.—Completely cured clinically. A little black pigmentation still persists.</p>	<p>19.2.29.—W.R. + K. + + 19.3.29.—W.R. + K. + + 3.5.29.—W.R.O. K.O.</p>	<p>This case was clinically cured 42 days from start of treatment, patient having had six injections of Bismuth Arsanilate, totalling 18 gr. Seventy-three days from start of treatment, no further treatment having been given, patient was serologically negative. In this case, the yaws crusts were remarkably persistent in vicinity of chin.</p>

Case.	Name, etc.	Age.	History.	Condition when first seen.	Details of Injections.	Progress of Case.	Serological Tests.	General Remarks.
V.	Salim bin Andallah. First seen on 8.12.28.	26	About two months ago received a sword wound in right index finger. This wound became infected, and the generalized eruptions developed a week or two later.	"Primary Yaw" on right index finger is covered by a large, yellow crust. Typical yaws crusts scattered over front and back of trunk; three crusts on face; four on right shoulder; two on right antecubital fossa; four on each lower limb. Slight general glandular enlargement. Numerous whitish areas present, apparently marking the site of previous yaws crusts.	10.12.28.—Gr. iii. pain. 14.12.28.—Gr. iii. effects. 20.12.28.— 24.12.28.— 27.12.28.— No ill No ill " " "	14.12.28.—Several crusts have started to dry and are pinkish in colour. 20.12.28.—Eruptions almost completely gone. All lesions bluish-white and flush with surface. 27.12.28.—All lesions completely healed. Only dark pigmented spots remain. Patient absconded. 28.12.28.—	No serological tests were performed, as patient was difficult to deal with.	A complete clinical cure was obtained 19 days from start of treatment, patient having received four injections, totalling 12 gr. of Bismuth Arsanilate. In all, he received five injections totalling 15 gr. Serological tests were not performed.
VI.	Kibwana bin Juma. First seen on 14.12.28.	26	Two months ago a boil developed on back of left buttock. This healed, but a month later, the generalized eruption broke out.	Body and face very thickly plastered with typical yaws crusts of dirty-green colour; a few scattered yaws crusts on upper and lower limbs, generalized glandular enlargement.	14.12.28.—Gr. iii. pain. 17.12.28.—Gr. iii. effects. 20.12.28.— 24.12.28.— No ill No ill " "	17.12.28.—Scabs shrivelling somewhat. 20.12.28.—All lesions now dry, but crusts not yet separated. 24.12.28.—The dried-up scabs have not yet separated. 28.12.28.— Patient absconded.	14.12.28.— W.R. ++ K. ++++	The rash had very nearly disappeared ten days after start of treatment, patient having received three injections, totalling 9 gr. of Bismuth Arsanilate. In all, he received four injections, totalling 12 gr.

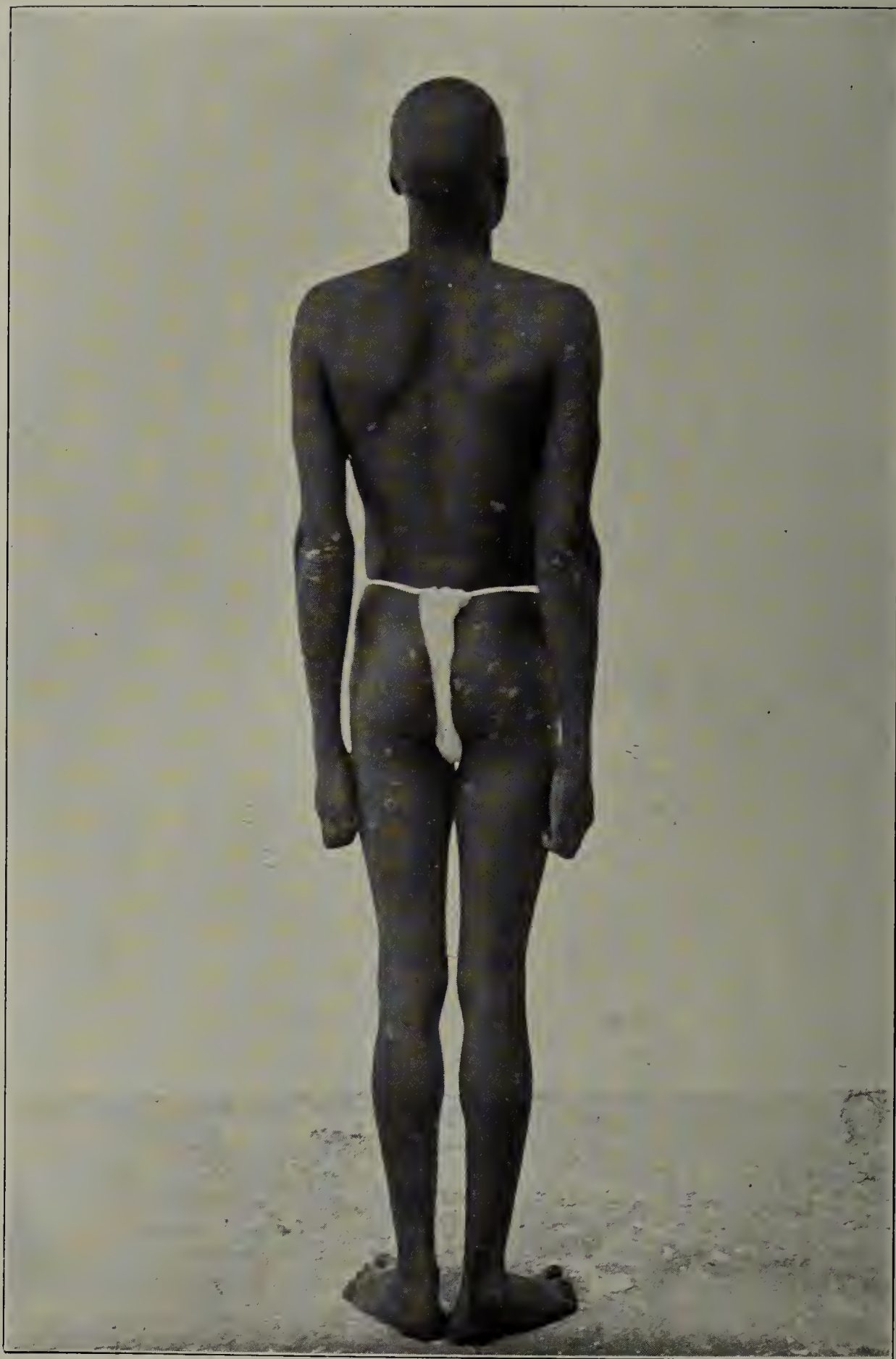
PHOTOGRAPHS OF YAWS TREATED WITH BISMUTH ARSANILATE.

By DR. W. K. CONNELL and DR. T. LANGAN.



Case I.—Photograph taken on 2.1.1929.

[To face page 210.]



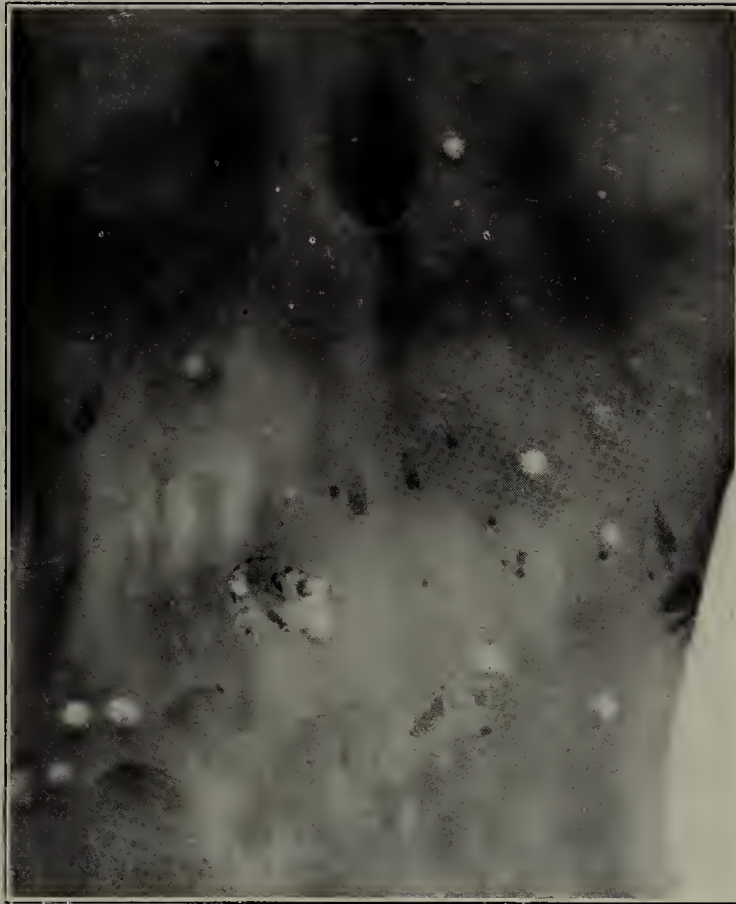
Case I.—Photograph taken on 2.1.1929.



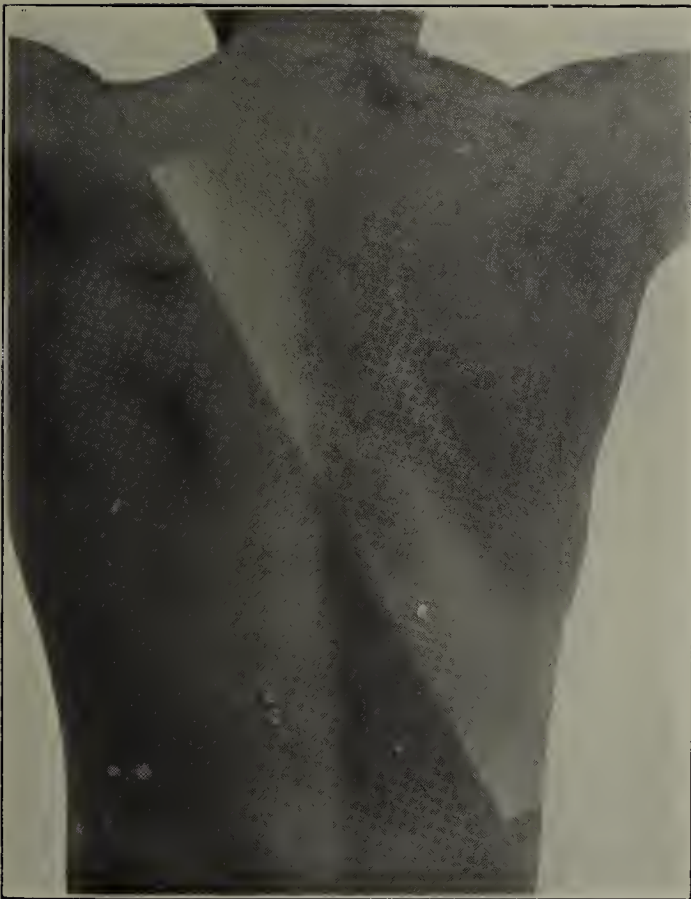
Case I.—Photograph taken on 24.1.1929.



Case I.—Photograph taken on 24.1.1929.



Case II.—Photograph taken on 24.1.1929.



Case II.—Photograph taken on 6.2.1929.



Case II.—Photograph taken on 9.3.1929.



Case III.—Photograph taken on 24.1.1929.



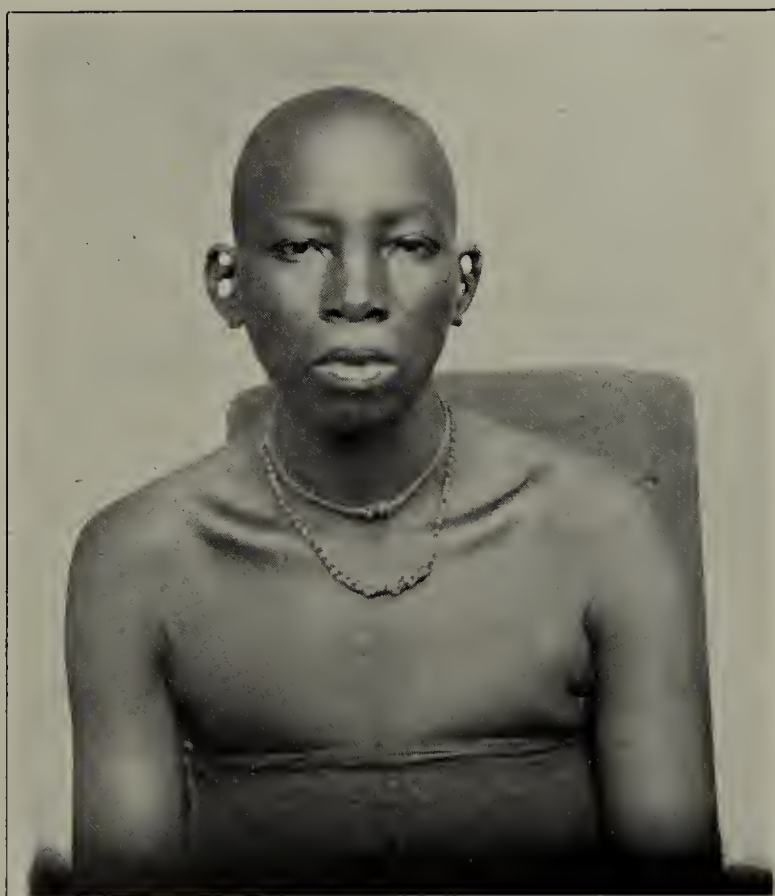
Case III.—Photograph taken on 6.2.1929.



Case IV.—Photograph taken on 19.2.1929.



Case IV.—Photograph taken on 12.3.1929.



Case IV.—Photograph taken on 2.4.1929.

NOTES ON (a) SPINA BIFIDA, (b) CARDIAC THROMBOSIS, (c) TUMOUR OF THE PAROTID, (d) ULCERS OF THE LEG, AND (e) ASCARIASIS. BY DR. J. WILLIAMSON, M.B., CH.B. (EDIN.), MEDICAL OFFICER, LUSHOTO.

Interesting Cases.

(a) *Spina Bifida*.—Photographs attached. This case is reported because of its rarity, and not because it presents any special features.

The child was a female Msambaa, aged three months. She was brought to me on 27th November, 1928, because of a swelling on her back. The parents had noticed the swelling at birth. It was then about the size of a hen's egg, but had slowly grown until now it had a diameter of 4 inches. The skin over the top of the swelling was shiny, and the parents were frightened it would burst. No other symptoms were complained of.

On examination, the swelling was seen to be a meningocele or a meningo-myelocele. It was very tense and the gap in the vertebra could not be felt.

On 29th November, 1928, the swelling was tapped and 30 c.c. of cerebral fluid allowed to drain off. This almost completely reduced the swelling, and the gap was felt at the level of the 5th lumbar vertebra.

In two days the swelling was as big as ever, so it was decided to operate. Text-books state that the best age to operate is at nine months, but against this one argued: 1. That the swelling showed signs of breaking down. 2. If once sent away the parents would almost certainly not bring the child back again. 3. There were no other symptoms or deformities, so that if the child survived the anæsthetic, the chances of a complete cure were good.

The operation was performed on 10th December, 1928; 3 oz. of a C.E. mixture were used after induction with chloroform, and the child stood the anæsthetic very well.

The child was placed on the table with the head low. Two curved incisions were made in the healthy skin on either side of the sac. These flaps were raised and the sac isolated. It was found to have a narrow neck, and to protrude from the 5th lumbar vertebra, the spine of which was missing and the laminæ incomplete. The sac was then opened carefully and the cauda equina and some nerves were found spread out over the inner aspect. These were dissected off mainly by gauze dissection, and were returned to the spinal canal, not without some difficulty. The neck of the sac was then ligated and the redundant portion cut away. Two continuous catgut sutures were then inserted. (After opening into the sac, it was found that no leakage of cerebro-spinal fluid occurred if the edges were kept raised.) The skin wound was then closed, no attempt being made to make muscle flaps.

Recovery was perfect. There was no leakage and the skin wound was almost completely healed in a week.

Seen again on 20th January, 1929, the baby was in excellent health and there was no impulse on crying.

(b) *A Case of Cardiac Thrombosis*.—A male Native Msambaa, aged about 40 years, was brought to the hospital by the police, having been found dead beside a river, where he had apparently been washing his clothes.

At the post-mortem, everything appeared to be negative, till a small greyish patch was noticed near the apex of the left ventricle. On careful examination, there was seen to be a triangular patch in the heart muscle, which was red at its base and greyish near its apex. The left coronary artery was found to be atheromatous, almost throughout its entire length, and there was a thrombus about an inch long in the descending branch near its origin. The aorta showed little or no atheromatous change.

(c) *A Tumour of the Parotid*.—A parotid tumour was removed from a male Native aged about 35 years. It was as big as a man's fist, was hard and nodular and weighed 12 oz. It had been slowly increasing in size for at least 10 years, yet it was still freely movable and there was apparently no glandular involvement. In addition, it shelled

out easily and completely, and microscopically there were no areas of necrosis. The microscopic appearance was that of a chondroma, and there was one small area which looked like definite cartilage.

Sections were sent to the Laboratory for microscopic examination.

(d) *Ulcers of the Leg*.—Smears, scrapings and serum from many ulcers of the leg were examined during the year. Nothing was found but the usual fusiform bacillus and spirochæte.

Many forms of medication were tried for these ulcers, intravenous, intramuscular, oral and local, but none was found which promoted rapid healing. Potassium permanganate appeared to be no better than several other antiseptics. Apart from treating the underlying cause, two points appear to be of note.

- (1) Almost any antiseptic will clean the ulcer.
- (2) The healing time is reduced by about one-third if the patient can be made to rest in bed. The rest in bed should not be absolute.

(e) *Ascariasis*.—Experiments were made with the following drugs in the treatment of infections with *ascaris lumbricoides*.

- (1) Oil of chenopodium alone, 0·5 c.c.
- (2) Carbon tetrachloride alone, 3 c.c.
- (3) A mixture containing these two drugs.
- (4) Santonin alone, 2 to 3 gr.

The doses given are for adults.

All were found to be efficacious, but santonin is possibly the best, if only because it can be repeated and the treatment completed in three days.

One case of a Native child, aged six months, is interesting because of the number of worms removed. Santonin 1 gr., with castor-oil, was given on three successive days. On the first day, 110 worms were removed, on the second day 12, and on the third day 1. Treatment was not continued.

NOTES ON A CASE OF MALARIA- (?) BLACKWATER-BILHARZIASIS- AND ASCENDING PYELITIS.
By DR. D. PLUM, M.R.C.S. (ENG.), L.R.C.P. (LOND.), MEDICAL OFFICER, TUKUYU.

The patient has lived in a tropical country for one year and has enjoyed good health.

She develops subtertian malaria. Under quinine treatment she progresses normally.

There is a period of nine day's pyrexia. On the tenth day suppression of urine occurs for 16 hours. "Black" urine is then passed, which gives a positive reaction with guiacum and ozonic ether. The patient vomits frequently for 12 hours, and is jaundiced. Low, continued fever is noted and the patient draws attention to a pain in the right kidney area.

Eight days after the passage of the "black" urine *Bilharzia* ova (*Bilharzia hæmatobium*) are seen in the urine. There is a slight amount of pus present. Five days later the quantity of pus in the urine is markedly increased. *Bilharzia* ova are still present. Emetine hydrochloride, gr. 2/3, is given subcutaneously on three successive days.

The patient's chief complaint is now pain in the right kidney area, especially marked upon movement or palpation. The urine is acid and purulent. *B. coli* are present in large numbers. No casts are present. No *Bilharzia* ova are seen. Rigors occur with profuse sweats. No malaria parasites are present in the blood. The temperature remains above 101° F. for four days; falls to between 98° F. and 100·6° F. for four days, and again rises and remains above 101° F. for four days.

Pot. Citrate and Pot. Bicarbonate are now exhibited in large doses (of each 1 drachm t.d.s.), and the patient's temperature falls by crisis, and remains normal or subnormal.

A CASE OF SPINA BIFIDA *BEFORE* OPERATION.

By DR. J. WILLIAMSON.

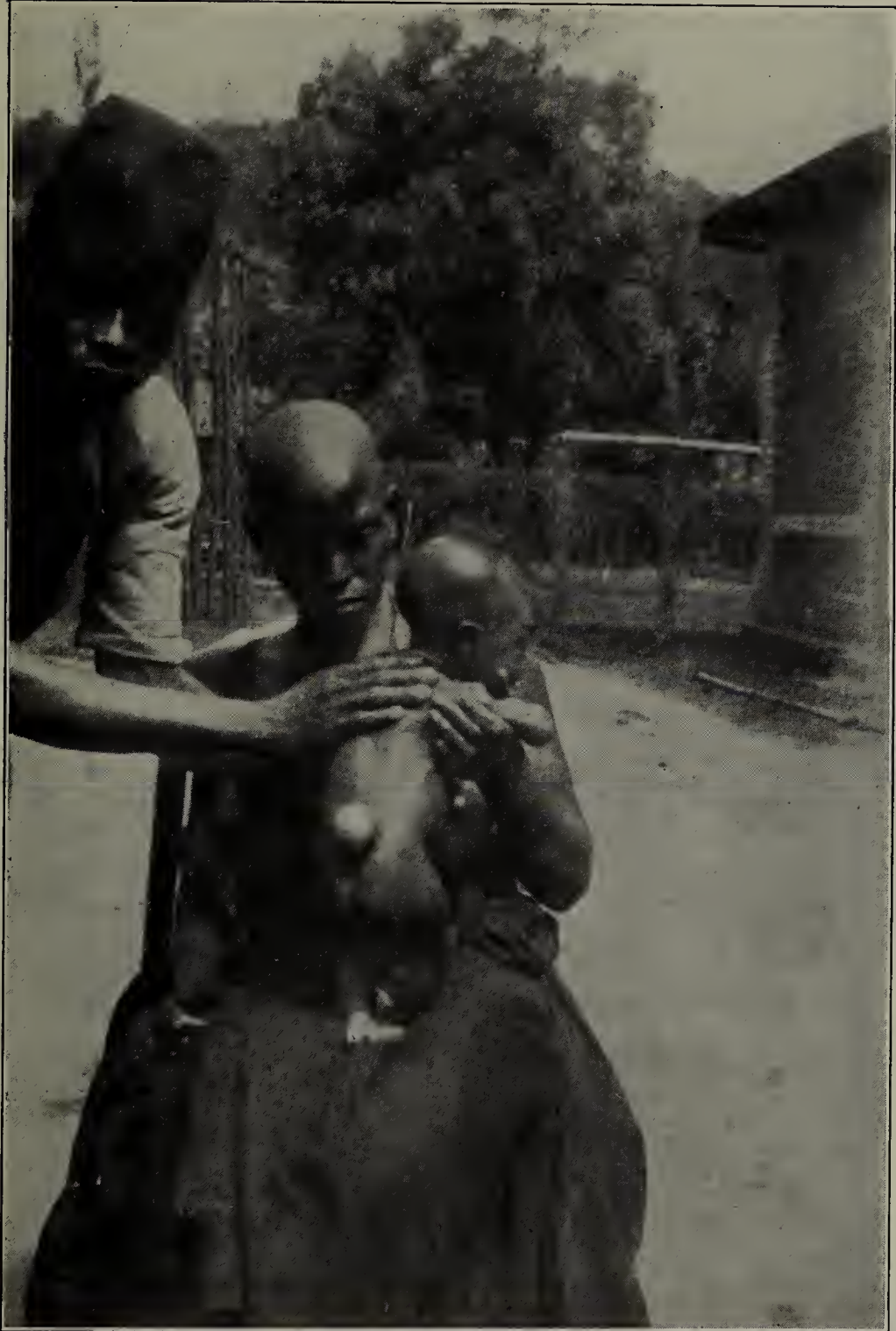


FIG. 1.

A CASE OF SPINA BIFIDA *AFTER* OPERATION.

By DR. J. WILLIAMSON.



FIG. 2.

Rapid improvement occurs. The pain in the kidney area lessens and vanishes ; the urine becomes free from pus within ten days. Bilharzia ova are not again seen in the urine.

I was called to see the patient, a German woman, aged 22 years, married, on May 7th, 1928. She was in bed and complained that for the past three days she had suffered from rigors and sweats, with headache and pains in the limbs and back. Her husband had kept a chart of her temperature, which presented the text-book features of a chart of subtertian malaria.

The patient had been in the tropics for 11 months and had enjoyed good health. Before her marriage she had lived in Italy (Bologna and Sicily) where she had suffered from malaria on two occasions, in 1913. In 1927 she had been operated upon and her "ovary had been removed." Two weeks after the operation she had suffered from "inflammation of the bladder" for 7 days.

7th May. Physical signs :—

Temperature, 98·6 F.

Heart, normal.

Lungs, normal.

Spleen, enlarged to two fingers below costal margin.

Blood, no parasites seen.

For the past three days the patient had taken 1 grm. of Plasmochin Co. daily. Although the blood was negative, the history, temperature curve, and enlarged spleen made the diagnosis of malaria almost certain. The Plasmochin Co. was stopped and the patient given quinine bi-hydrochloride by mouth in gr. 30 doses daily. The pyrexia reacted to the quinine.

From May 9th to the 15th the patient felt quite well, and on the 15th she travelled in a "machela" for a distance of 5 miles. On the evening of that day she complained of pain in the loins. On 17th May she "felt feverish," and during the night of the 17th-18th and the day of the 18th she passed no urine. The loin pain continued. At this time I was on "safari." I returned on 20th May, and was informed by the Sub-Assistant Surgeon that the patient's urine, passed on the morning of 19th May, was "almost black," and gave a positive reaction to guiacum and ozonic ether. He had not examined it microscopically.

20th May. The patient was in bed and complained of loin pain. I was informed that she had vomited "continuously" during the night of 19th-20th May.

Physical Signs :—

Temperature, 99·8 F.

Pulse, full and bounding, 86.

Lungs, normal.

Heart, normal.

Abdomen—

Spleen not palpable.

Liver not palpable.

Pain on deep palpation in kidney areas.

Patient slightly jaundiced.

No œdema of feet nor ankles.

Blood, Negative for malaria.

Urine—

Highly coloured and opaque.

Thick whitish deposit—disappeared on heating.

Clear after filtration.

Trace of albumen.

No bile.

No reaction to guiacum and ozonic ether.

No casts seen.

A few epithelial and pus cells present.

The patient was given water throughout the night. Fomentations and mustard plasters were applied to the loins and mixture was given every two hours for 8 doses.

Urine was passed freely throughout the night, and on the following morning the urine, though still highly coloured, was clear.

From 20th May to 26th the patient's condition was good. Urine was passed in normal quantities. It was acid and contained a trace of albumen. The jaundice gradually lessened and the loin pain was slight. There was low continued pyrexia, the temperature never rising above 100° F.

On the 26th May the patient first complained of pain in the bladder upon micturition. "She felt she wanted to continue."

Urine—

Acid.
Deep straw colour.
Cloudy, with discrete whitish particles in it.
Clear after filtration.
Faint trace of albumen.
No reaction to guiacum and ozonic ether.

Microscopically—

No casts.
Epithelial debris.
A few blood and pus cells. (About 4 to a field $1/6 \times 2$ eye-pieces.)
Bilharzia hæmatobium ova.

The patient stated that she had bathed in the lake at Mwaya—noted for its Bilharzia—in November, 1926. She had never before experienced pain upon micturition, nor noticed anything abnormal in her urine.

On the 1st June the patient came by car to Tukuyu. An attempt was made to give antimony tartrate intravenously, but the nervousness of the patient rendered this impossible. Emetine hydrochloride, gr. $2/3$, was given subcutaneously in place of antimony. At the same time hexamine and acid phosphate was given.

On the 1st June Bilharzia ova were again seen in the urine. At this date a considerable increase of pus cells was noted. (With a magnification $1/6 \times 2$ the number of cells had increased from an average of 4 to a field on the 27th May, to an average of 50 to a field on 1st June.) Emetine, gr. $2/3$, was given subcutaneously on three successive days, and from the 3rd June to the present date Bilharzia ova were not seen again.

On the 3rd June the patient's temperature rose suddenly from 98·6° F. in the morning to 102·6° F. in the evening, and on the evening of that day the patient complained of loin pain, most marked in the right kidney area. For the following eleven days the patient suffered from rigors, high fever, and drenching sweats; she complained of great pain in the right kidney area, especially upon movement, and of painful micturition.

Urine—

Passed in normal quantities.
Slightly acid.
Highly coloured and cloudy.
Cleared after filtration.
Offensive smell.
Thick, whitish deposit.
Trace of albumen.
Many pus cells.
B. coli in large numbers.
No casts.
No ova.

There was tenderness upon palpation in the right kidney area, but no palpable nor visible swelling. The spleen and liver were not enlarged. Blood negative for malaria.

A diagnosis of cystitis with ascending pyelitis was made, and urinary antiseptics were given, with hot fomentations to the loins.

This condition of high irregular fever, with loin pain and the passage of purulent urine continued until 14th June.

Large doses of alkalies were then given :—

R.

Pot. citrate.
Pot. bicarb. aadr. I t.d.s.

with salol gr. 5, t.d.s.

On that date the patient's temperature fell by crisis, and remained normal or subnormal for the remaining time she was under observation. On the third day after the exhibition of the alkalis in large doses there was a marked decrease of pus in the urine, and after a further six days the urine was almost free from pus. At the same time the patient's general condition rapidly improved, the loin pain disappeared, and on 18th June the patient had no complaints.

NOTE ON A CASE OF AORTIC ANEURYSM IN AN AFRICAN NATIVE. BY DR. F. VASEY
ADAMS, M.B., CH.B. (GLAS.), MEDICAL OFFICER.

Kapela bin Suleys, aged about 25, of the Sukuma tribe, from Mwanza District, was admitted to the Government Hospital at Tanga on November 28th, 1928, complaining of feeling too tired to work.

As a child he suffered from smallpox, after which he had no illness until he contracted syphilis, ten years ago, and shortly afterwards, gonorrhœa.

About three years ago he began to suffer from a burning pain in the legs—"like the burning of iodine"—attacking him suddenly at intervals varying from moments to a fortnight, and lasting from a few seconds to several minutes. These pains were superficial; most severe over the fronts of the shins and the insteps. During a pain he was unable to walk.

Simultaneously he developed a tendency to suffer, often, from a sensation of constriction round the trunk, at the level of the 9th costo-chondral junction. (The scars of a large number of blood-letting gashes were to be noted encircling the body like a belt). Constipation predisposed to the girdle sensation, and if he took a meal while it was present, the resulting pain prevented him from sleeping. Later the sensation came on daily, whether he was constipated or not.

The third prominent symptom, retrosternal pain, developed about the same time. It became constant, but varied in severity. The point of maximum pain was just below the episternal notch.

Pains developed in the arms, but they were similar to those in the legs.

Palpitations developed, but were not very troublesome.

Two months ago, he noticed transient swellings of the eyelids and ankles.

Changes in the voice on coughing and eye troubles have never been present.

Family History.

His father died young, after a two-years' illness connected with a swelling in his groin, his death being attributed to witchcraft.

His mother and brothers were alive and healthy when he last heard of them three years ago.

General Examination.

The patient, an intelligent man, lay comfortably in bed in the dorsal decubitus. His respirations were 19 to the minute, his pulse 69, and his temperature 98·8° F. He was moderately well nourished, and showed no signs of anæmia. The general musculature was poorly developed. No swelling of the ankles or eyelids was noted. The superficial inguinal lymphatic glands were slightly enlarged and moderately hard, as were the sub-maxillary group. Otherwise no palpable enlargements were noted.

Cardio-vascular System.

Pulse.—The pulse was regular in rate and rhythm, of good volume, and very low tension—almost a Corrigan's pulse. The radial pulses were unequal, the left being poorer in volume and later of onset than the right.

The systolic blood pressure (?) as recorded on a Riva-Rocci Sphygmomanometer was 97 mm. Hg, and the diastolic 60 mm. Hg. N.B.—This instrument has always seemed reliable.

Capillary pulsation could not be demonstrated.

Heart.—The apex beat was visible in the 6th left intercostal space, one inch outside the nipple line. It was diffuse.

Epigastric pulsation, and marked pulsation in the episternal notch and great vessels of the neck, were present.

No thrills were felt.

Percussion defined the limits of cardiac dullness as at the upper border of the 3rd rib, and the right border of the sternum.

Auscultation revealed a loud, blowing systolic aortic murmur, the point of maximum intensity being at the junction of the aortic cartilage with the sternum. The second aortic sound was loud, but the pitch was normal.

The mitral and other valves appeared to be competent.

Nervous System.—The pupils were small and equal and reacted to accommodation, but not to light. The triceps jerks were present and active. The knee jerks were feebly present. No plantar response could be elicited. Ankle clonus was not present. His walk was slightly ataxic, but co-ordination of movements of the upper limb was perfect.

Sensation was unimpaired. There was no Rombergism.

Urinary System.—At first his urine was normal. Later it contained traces of albumen.

Further History.

At first it was impossible to keep him at rest. Later he remained lying down. He was allowed ordinary diet, and was given 120 gr. Pot. Iod. daily. Sedatives were unnecessary.

Four weeks after admission transient swellings of the feet and legs appeared, their appearances coinciding with traces of albumen in the urine.

He died very suddenly on 20th January, 1929, at night.

Post-mortem.

A post-mortem held the following morning revealed a ruptured aneurysm at the junction of the ascending and transverse parts of the aorta. The left pleural cavity was full of blood. The heart was moderately enlarged, and fatty. All the valves were competent.

There was fibrosis of the apices of both lungs.

No abnormalities were noted among the other organs.

REPORT OF KIBONGOTO HOSPITAL ON WORK IN CONNECTION WITH TUBERCULOSIS FOR THE YEAR 1928. BY DR. H. N. DAVIES, M.B., CH.B. (EDIN.), D.T.M. (LIV.), MEDICAL OFFICER IN CHARGE.

Introduction.

The year 1928 opened to show a small hospital at Kibongoto providing for the treatment of a possible number of twenty-four in-patients, having neither office, laboratory, nor proper dispensary, and with the majority of the work being carried out on the front and back verandahs of the Medical Officer's house.

A start had been made, and that was all that one could say. Touring during 1927 had shown that tuberculosis was considerable in the district, but on our attempting to trace

cases found on these tours we were doomed to disappointment owing to insufficient details having been collected.

This was the first drawback, and decided us to overhaul our methods completely.

Scheme of Work.

Bearing in mind that according to the present state of our knowledge of pulmonary tuberculosis it must be accepted that only in selected cases can successful treatment be expected, and that it is essential at this stage for us to attack the disease from the point of view of prophylaxis rather than of treatment, it was decided that it would be better to search for tuberculosis in families than to pick out isolated cases ; that should the original case be too serious, it were wiser to try and teach him how to prevent further spreading the disease in his own house than to take him to hospital where treatment might not be successful ; and rather to examine his family or other contacts, treating these, when necessary, for the disease which in all probability would be curable in them. In the case of tuberculosis other than pulmonary, hospital or out-patient treatment to be given as soon as possible.

In order to carry out this scheme it was decided that more direct contact with the individual would be obtained if the Native himself were made an intermediary. From this arose the idea of employing African Tuberculosis Health Visitors.

Carrying out of Scheme.

A. *Tuberculosis Health Visitors.*—It will be seen from the little sketch map accompanying this report that it was correctly surmised that most patients would come from the Kibongoto-Machame area into hospital, and it was therefore decided to start a Tuberculosis health visitor there.

His special duty was to act as a medium between the patient who had been discharged from the hospital and the hospital itself. Thus any discharged case was visited in his home by the Tuberculosis health visitor, who regularly reported progress, nature of surroundings, state of health of family of diseased, and, if he still remained infective, showed him how to prevent further trouble to his family.

Where further supplies of medicine were required by the patient, or equipment such as sputum cups, etc., the health visitor saw that these were procured, or took the patient to the Travelling Dispensary, in charge of a Compounder, which visited Machame Camp weekly.

The family of a very sick man, and any suspected of the disease in other families, that were known to have tuberculosis, were taken by the health visitor to the dispensary, where the Compounder examined them and marked them for out-patient treatment, which meant regular visits to the dispensary, or recommended them for hospital as in-patients, according to the extent and kind of infection.

Again, it was the duty of the health visitor to visit for purposes of investigation different neighbourhoods of his area, new cases being reported, and, if possible, the whole family being taken either to the dispensary or to the hospital itself, for examination.

In this way not only was it possible to follow up patients who had been in hospital, but a certain amount of very definite prophylaxis was also achieved.

2. The other health visitor was started in the North Upare area, where it was known that disease was considerable, but where the fact of there being no hospital and therefore no discharged patients to follow up rendered the work of the health visitor much more difficult.

Here, therefore, was chosen a more intelligent Native, who possessed a certain amount of initiative, and was well known to the people.

With a few of the commonest drugs he visited different neighbourhoods of the mountains, practically calling at every house, searching for any cases he thought might have tuberculosis. Where they had any other disease that he could recognise he gave them

medicine, where he suspected tuberculosis he took full particulars, and the Medical Officer, making regular tours to that district, was able to examine cases, and sometimes whole families, that the health visitor had gathered together.

Many families escaped examination, and difficulties in trying to trace disease were enormous, but it is quite certain that through the work of this health visitor we were able to discover many cases which could have been found in no other way, and quite often a clear, definite history of infection was found running through a family from one generation to the other.

B. *Co-operation with Missions*.—Although the health visitors proved a good working proposition, the staff was too small to enable us to extend the idea to other areas, and other means were then tried.

A circular letter was therefore sent to all the missions scattered at different places on the mountains, and their help in the work requested. It was pointed out that where hospital accommodation was available and treatment known, we were not desirous of taking their Natives away to the hospital at Kibongoto, rather that we hoped that they would co-operate in the general scheme of prophylaxis and treatment.

Some missions did not reply, while others suggested somewhat rigid changes along economic lines which were rather beyond my sphere of work.

Two, however, at once welcomed the idea; and, as a result of the reply from the Roman Catholic Mission at Kilema, a special tour was made, with excellent results. Many cases of tuberculosis were found, and the nursing sister at the mission offered to visit families in which disease had been discovered.

By means of this Mission co-operation was also established with their branch mission at Mkuu, in Rombo, and the sister there was also willing to visit families, and generally help in the scheme.

Kilema has as yet no hospital, and many cases were therefore brought to Kibongoto, while Mkuu Mission is hastening with its hospital, which has been delayed owing to lack of labour.

The Protestant Mission at Schigattini, in Upare District, was also willing to help, and some interesting cases were discovered through their aid.

C. *Travelling Dispensaries*.—From west to east of Kilimanjaro, Machame, Kibosho, Uru (not too successfully at Kibosho and Uru), Mbokomo, Old Moshi, Kilema, Mamba, Mwika, and in Rombo, Keni, Mkuu, Mashaiti and Ussere, and in Upare District, Usangi, were visited periodically by these dispensaries, under the Medical Officer, the Compounder, or a Native dispenser regularly supervised by the Medical Officer.

D. *Midwifery Clinic, Machame*.—The Sisters of this clinic have been exceedingly helpful in searching out patients, and generally aiding the work going on at Machame.

Should the premunising of children be found feasible during future years, this clinic should be able to render us valuable assistance.

Success of the Scheme.

Considering it under the aforesaid headings :—

A. *Tuberculosis Health Visitors*.—There can be no doubt whatever that this method is exceedingly valuable. In the Machame area, 110 cases that left hospital were followed month by month and progress or otherwise reported; this figure speaks for itself.

In Upare we have been able to record 240 cases in 121 families, due almost entirely to the work of this health visitor, and it became advisable to open a branch hospital at Usangi, the largest centre in the North Upare area.

B. *Co-operation with Missions*.—As a result of visits to Kilema, 85 cases, of whom 29 were taken to the hospital at Kibongoto, were discovered. The sister there is practically doing the work of an health visitor for us.

As has already been stated, the sister at Mkuu Mission, where a hospital will be completed shortly, has also offered to visit the families in her area.

Dr. Puff, at the Protestant Mission Hospital of Machame, reported 35 out-patients treated by him.

C. *Travelling Dispensaries*.—The Travelling Dispensary at Machame is doing excellent work. The others also have been very successful in picking out cases of tuberculosis from those generally treated, and towards the end of the year it was only the fact that the allocations for transport and upkeep were running so low that more patients were not brought into hospital.

Summing Up.

Speaking generally, for all four methods, there can be no doubt that the scheme is working satisfactorily in so far as the searching out of the disease is concerned, 612 cases having been recorded during the year (quite apart from the returns from Moshi Hospital, and the 35 of Dr. Puff at Machame).

DETAILS OF THESE 612 CASES OF TUBERCULOSIS IN WHOLE DISTRICT.

Pulmonary	..	..	..	..	..	..	..	..	406
Glandular	..	..	..	..	..	..	..	..	135
Spinal Disease	..	..	..	..	..	..	..	..	31
Joint Disease	..	..	..	..	..	..	..	..	13
Bone Disease	..	..	..	..	..	..	..	..	13
Chronic Disseminated	..	..	..	..	..	..	..	..	10
Peritonitis	..	..	..	..	..	..	..	..	3
Meningeal	..	..	..	..	..	..	..	..	1
Total	..	..	..	..	..	..	..	..	612

Remarks.

1. The great preponderance of pulmonary over all other kinds of tuberculosis.
2. The fact that the 612 cases found were drawn from 384 families.

Districts in which Cases were found.					Method.
Masai	..	..	..	2	Hospital.
Kibongoto	..	..	..	11	Health Visitor.
Machame	..	..	..	110	Health Visitor, Dispensary.
Kibosho	..	..	..	3	Dispensary.
Uru	..	..	..	—	Dispensary.
Mbokomo	..	..	..	3	Dispensary.
Old Moshi	..	..	..	16	Dispensary.
Kilema	..	..	..	85	Mission, Dispensary.
Marangu	..	..	..	29	Dispensary.
Mamba	..	..	..	16	Dispensary.
Mwika	..	..	..	9	Dispensary.
Keni Rombo	..	..	..	10	Dispensary.
Mkuu Rombo	..	..	..	30	Mission, Dispensary.
Mashaiti Rombo	..	..	..	30	Dispensary.
Ussere Rombo	..	..	..	18	Dispensary.
North Upare District	..	..	..	240	Health Visitor.
Total	..	..	..	612	

Remarks.

1. Largest numbers were returned from Upare, Machame, Kilema.
2. The large percentage discovered through the activities of the health visitor.
3. The usefulness of mission co-operation.

Discussion of Results and Inferences drawn therefrom.

1. Although the figure of 612 shows that all four methods have been extremely useful, the fact that these 612 were found amongst such a large number of families as 384 may seem to suggest that the idea paramount in the scheme, namely, of investigating families rather than isolated cases, has not met with any real measure of success in that a higher degree of familial infection has not been discovered.

Certainly in a large percentage only isolated cases have been found, as compared, for example, with a certain instance where nine occurred in a single family.

But if one considers the obstacles continually encountered by both the health visitor and the Medical Officer, it will not be hard to realize that one can only go slowly in the face of the natural prejudices of the Native ; to obtain anything like a connected history is by no means easy, nor does the Native yet appreciate the fact that he may have a disease without feeling especially ill, and in connection with what must necessarily be a purely voluntary examination of families only time and the growing confidence in the work that is being done for him will overcome this difficulty.

2. There can be no doubt that the most useful of the methods employed is that of the "Tuberculosis Health Visitor," whether it be in following up patients who have been discharged or in the search for new cases. The other methods naturally co-operate with this.

3. In studying the general figures one cannot but notice the preponderance of pulmonary cases. This is, of course, natural, as it is nearly always the pulmonary case that is first noticed—and which leads to a further investigation often resulting in glandular, spinal or other type of tuberculosis being found.

But this fact in itself rather suggests that we are dealing mostly with the human type of bacillus. This is open to discussion, but in 10 of the 31 cases of spinal disease there is definite history of pulmonary infection in the family, and it may be that the other 21 have not been sufficiently investigated.

The glandular are, as a rule, all from families with pulmonary infection—while the bone and joint show a fairly high percentage of other infection in the family.

Also the Veterinary Department insist that they have as yet encountered no single case of bovine infection in the cattle of this district.

This question can, however, only be decided by laboratory methods.

The Hospital, Kibongoto.

During the year, without any outside assistance, a stone building was erected and finished, providing offices and laboratory ; while three new wards, providing for a further 24 beds, were erected of mud and wattle with corrugated iron roofing, the compounder's house and compound were finished, an incinerator and latrines made.

Eucalyptus and cedar trees were planted and proper paths made. The grass grows very quickly, and for some time we had great difficulty in keeping the place clean, but the Native Authorities are now going to give us help in this direction.

A new spring of good water was found quite near to the hospital, though, unfortunately, below the level of both the hospital and the Medical Officer's house, but it has rendered the work of carrying water much easier.

In-patients.—A total of 372 in-patients have received treatment during the year, of whom the following are the chief diseases :—

Tuberculosis	..	..	..	..	..	..	..	115
Malaria	..	..	..	..	..	..	..	58
Worms	..	..	..	..	..	..	..	55
Other diseases of the chest	..	..	..	..	..	..	..	33
Yaws	..	..	..	..	..	..	..	25
Syphilis	..	..	..	..	..	..	..	15
Cases Investigated.	Kind.				Treated as In-patients.			
406	..	..	Pulmonary	..	..	82	(4 Usangi Hospital).	
135	..	..	Glandular	..	..	22		
31	..	..	Spinal Disease	..	..	7	(1 at Usangi).	
13	..	..	Joint Disease	..	..	7		
13	..	..	Bone Disease	..	..	1		
10	..	..	Disseminated	..	..	—
3	..	..	Peritonitis	..	..	1		
1	..	..	Meningeal	..	..	—
Total	612					120	(5 Usangi Hospital).	

Cases.	Where from.				In-patients.
2	Masai ..	..	..	..	2
11	Kibongoto ..	..	..	..	9
110	Machame ..	..	..	..	43
3	Kibosho ..	..	..	..	1
3	Mbokomo ..	..	..	..	—
16	Old Moshi ..	..	..	..	2
85	Kilema ..	..	..	..	29
29	Marangu ..	..	..	..	13
16	Mamba ..	..	..	..	4
9	Mwika ..	..	..	..	2
10	Keni Rombo ..	..	..	..	3
30	Mkuu Rombo ..	..	..	..	3
30	Mashaiti Rombo ..	..	..	..	2
18	Ussere Rombo ..	..	..	..	1
240	North Upare ..	..	..	..	6 { (1 at Kibongoto). (5 at Usangi).
Total	612				120

Extract from In-patient Return.

Tuberculosis: Kibongoto Hospital—

Kind.	Remained from 1927.	Admitted during 1928.	Died.	Total Treated.	Remained.
Pulmonary	12	66	6	78	18
Glandular	1	21	—	22	3
Spinal Disease	—	6	—	6	2
Joint Disease	1	6	—	7	2
Bone Disease	—	1	—	1	—
Peritonitis	—	1	—	1	—
Total	14	101	6	115	25

Average length of stay of Tuberculosis Patients 79·9 days.

Pulmonary.—Of the 78 treated—

Died in hospital during year	6
Left hospital—	
Died within the year	5
No change	7
Much improved, reported regularly as doing well	18
Clinically cured, regularly reported as doing well	24
Remained	18
	78

Four ran away and were reported as follows: 2 died within year, 2 in same condition; 1 ran away and came back of own accord. These are all included above.

Sputum Positive.—The number of pulmonary cases in hospital whose sputum was positive for the tubercle bacillus was 49 or 62·8 per cent.

Results of Pulmonary Cases whose Sputum was Positive.—Of these 49 cases—

Died in hospital	6*
Died within the year, after leaving hospital	5*
Discharged and reported in same condition	7
Discharged much improved, and reported regularly as doing well ..	12
Discharged as clinically cured, sputum negative, and reported regularly as doing well	7
Remaining in hospital	12
Total	49

* Only one of these was selected by a travelling dispensary for hospital treatment. Others came into hospital of their own accord, from Machame or Kibongoto.

Effects of Season on Pulmonary Cases.—Pulmonary cases are always worse during the rainy season.

Treatment of Pulmonary Cases.

Rest.
Fresh air.
Sunlight (ultra-violet rays).

Rest.—Cases coming into hospital, whether very ill or otherwise, were at once put to bed, a four-hourly temperature chart kept, and light diet prescribed. If the temperature did not exceed 99° F. the patient was allowed up the next day.

If the evening temperature exceeded 99° F. absolute rest in bed was ordered until the temperature once again came down.

After a chart of low temperature for some time patients were allowed to walk further each day, and eventually allowed, indeed persuaded, to do a certain amount of light labour, such as working in the hospital garden.

Diet was advanced to full, as nourishing as possible, as soon as fever had come down.

Fresh Air and Sunlight.—During the dry weather beds were carried out into the fresh air at 8 a.m., and every day at least two hours of actual exposure to the direct rays of the sun with chest uncovered was prescribed. The rest of the day was spent in the shade and the beds returned to the wards in the evening at 6 p.m.

During the rains beds were carried to the verandahs only. At night either door or window had to be kept open in each ward. Some wards actually preferred having both open.

Weight.—Every week the patients were weighed in order that progress might be watched.

Symptomatic.—Particular attention was paid to intestinal complications; these occurred in almost every severe case at some time or other.

Glandular Cases.—Of the 22 treated:—

Remained	...	...	...	...	3
Much improved	...	...	...	...	8
Cured	...	...	...	...	11

Spinal Disease.—Of six treated all received sunlight treatment, being in the direct rays of the sun for two hours every day, with back fully exposed to the sun.

Instead of using extension apparatus the postural treatment was adopted, patients lying on their faces propped up with cushions. This position is easily maintained without much discomfort, and, although only six cases have been treated, of which two remain in hospital, results were very gratifying. The curvature, even in the worst cases and of many months' standing, definitely improving week by week.

Apart from the two cases still in hospital, no one remained long enough for a cure, but two or three who came into hospital being unable to stand without supporting themselves with their hands on their knees were able, after a short time, to stand upright alone.

Unfortunately, the adults looking after them grew tired and wished to go home, but they all promised to keep the children in this position day and night, as had been done in hospital.

Joint Disease.—Treated entirely by exposure to sunlight, except in the case of hip joints, one of which has been in the hospital since it opened in August, 1927. He was first on extension treatment, went on to crutches, then to thick-soled boot, and is doing very well.

Another case grew tired of being away from home so long and went away just as the crutch treatment was almost ended. This, of course, is the difficulty one is always confronted with, namely, that the Native gets tired of the somewhat slow progress, and goes away just as everything is becoming satisfactory.

Branch Hospital at Usangi, Upare District.

As a consequence of continued requests by the people of this district that they might have a hospital, and taking into account the 240 cases of tuberculosis found there this year, a branch hospital was eventually opened at Usangi, the central camp, lying in the heart of the mountains.

This was done in December, and a Native dispenser, who had done useful work at Kibongoto, was put in charge. This hospital opened with four rondavel huts as wards, a dispensary hut and house for the dispenser. It is situated close to the Government camp there, has water quite near, while the site chosen allows plenty of room for expansion should the hospital become larger during the ensuing years.

At present it merely provides for 12 beds, 3 beds per ward. The return for December was :—

Eleven in-patients—

Pulmonary Tuberculosis (2 sputum positive)	..	..	..	4
Spinal Tuberculosis	..	..	..	1

It is intended to run this hospital on the same principle as that of Kibongoto, namely, of accepting all diseases, but keeping a high percentage for tuberculosis.

General Diseases Treated in the District.

A total of some 14,000 out-patient cases of other diseases were treated at the hospitals at Kibongoto and Usangi, and by the travelling dispensaries in the district whilst engaged on tuberculosis investigation.

Amongst others the following conditions received medical attention :—

Worms	..	..	..	..	..	..	..	7,337
Yaws	..	..	..	..	..	..	..	1,549
Bronchitis	..	..	..	..	..	..	..	1,360
Malaria	..	..	..	..	..	..	..	1,115

REPORT ON A CASE OF CONVULSIONS PROBABLY DUE TO TRYPANOSOMIASIS. BY MR. P. V. GOKHALE, L.C.P. & S. (BOMBAY), SUB-ASSISTANT SURGEON, KIGOMA.

A young anæmic Indian woman, who was staying in the Congo for about six months, was first diagnosed at Albertville as trypanosomiasis, on the 16th April, 1928. She had two injections of tryparsamide in the Congo on 16th April and 24th April, and she arrived here on 1st May.

Previous History.—No history of venereal disease. The patient had frequent bad attacks of cough extending for over a period of six years.

When she was first seen on 1st May she looked very pale, weak and extremely emaciated. The temperature was normal. The blood showed *Trypanosoma Rhodesiense*.

She had a very enlarged spleen extending four fingers below the costal margin. The liver was normal.

The apex of right lung showed signs of crepitations, and the apex of the left lung was also affected to a certain extent.

The patient had a third tryparsamide injection on the 5th May and a mixture of cod-liver oil and syrup ferri iodide to take internally. A fourth injection was given on 13th May. No ill effects of the tryparsamide were noticed. She had four Bayer injections on 24th May, 10th June, 17th June and 24th June.

Sketch Map of Moshi-Pare Area

to illustrate

Area referred to under Tuberculosis on Page 13
and Dr. Davies Report on Page 216



The patient got 103° F. temperature on 26th June, and showed *P. vivax*, but no trypanosomiasis in a blood slide. She was kept on a course of quinine for a month. The patient went to the Congo again before the C.S.F. could be examined. The patient said she enjoyed good health in the Congo. She had no more treatment there. She returned here about the 10th November, 1928, and she walked from the steamer to her house. Suddenly, on the 15th November, when she was taking her lunch, she started getting convulsions of the legs and hands and jaws and she was put to bed.

When seen she was getting clonic spasms of both legs and arms, more marked on the right side of the jaw with the right side of the mouth dragged up; mouth fixed, pupils equal and contracted, the neck not stiff; Kernig's sign present and ankle clonus on the right side. The spasms were more or less continuous and the whole body was moving. Nothing could be administered by mouth. The pulse could not be felt, the heart-beats were fast and irregular, feet and hands were cold and the skin covered with cold sweat. During the attack foam escaped through the mouth. The tongue was not bitten.

She was given one strychnine and digitalis injection, and hot water bottles were placed on both sides of the feet, chest and hands. At 3 p.m. the temperature in the armpit was 99°. The pulse could be felt but was very weak and quick. A blood slide was taken and no malarial parasites found. An injection of ether was given at 4 p.m., and a catheter specimen of urine was collected. It contained no albumin.

At 7 p.m. C.S.F. was drawn off in a test-tube. It came out under pressure up to 5 c.c., and then started dripping. The fluid was clear. After the process one quinine injection of gr. 6 was given. Intravenous saline was administered up to 100 c.c., but as the patient became more restless it had to be stopped.

At 9 p.m. the convulsions were the same, the temperature up to 103·8°. A blood slide was taken at this stage and another quinine injection of gr. 6 given.

At 10 p.m. one injection of camphor and ether was given. The patient remained restless up to 3 a.m., when the convulsions quietened and the patient showed signs of improvement. She appeared to recognize people, but could not speak.

Up to 7 a.m. on the 16th she continued improving. The relatives gave her some tea, and she could make signs to them with her hands, but suddenly she collapsed and died at 8 a.m.

The cerebro-spinal fluid was obtained clear and did not clot on standing. It was centrifuged and when examined was found to contain many lymphocytes but no trypanosomes. The last blood slide when examined was found negative to malaria and positive to trypanosomiasis.

REPORT ON A GENERAL SURVEY OF ANOPHELINE CONDITIONS ON THE TANGA-ARUSHA RAILWAY. BY MR. J. W. MCHARDY, B.Sc. (EDIN.), GOVERNMENT ENTOMOLOGIST.

The work of the survey commenced on 28th August, 1928, and finished on 21st February, 1929. During that time the area was very dry, the short rains being very slight. Only those breeding places which are least resistant to drying up can be discussed with certainty, as these were the only ones containing water at the time of inspection. Moderately reliable estimations, however, of the conditions during and after the heavier rains can be added.

The method of the work adopted was to make thorough search for the breeding grounds in the neighbourhood of selected places along the line, the larvæ being bred out for determination. I consider that in this way a more reliable result would be obtained than by making a rough examination, trying to cover the whole of the distance to a depth of, say, half a mile on each side of the line. The latter method would have taken considerably longer and would not have justified the time spent on the work.

The chief object in the investigation was to obtain an idea of the distribution of vectors of malaria, and for this reason Culecines were only dealt with when they occurred

in the breeding places where Anophelines were sought, and the work was not held up for the breeding out of the Culecines when the work on Anophelines was completed. When Culecines were obtained in the course of the work they were bred out and determined, but the results herein must not be taken as anything like a complete account of their occurrence in the districts in question.

The work was commenced at the coast and continued inland.

Tanga.

The breeding places at Tanga are already quite well known to the Medical Officer of Health, to whom I wish to express thanks for his conducting me round them on arrival.

The most important area is the Kososoro area, situated to the west of the European part of the town. This is the outlet of a stream which runs north. The upper part of the stream is not a breeding ground of importance, but as it approaches the sea gradient falls off and the stream becomes sluggish, and in the bottom 300 yards or so forms, along with some seepage water, chiefly from the west bank, considerable Anopheline breeding grounds. The marshy part also extends westwards along the Mombasa Road, on its south side, to a depth of 50 to 70 yards, to the bridge under the road where an outlet with very little fall allows, to a greater or less degree, the escape of the water to the sea. On my first visit there was also a culvert under the road at the east end of this part, but in road alteration this has been obliterated. The outlet from this culvert was not tidal, as in the lower side of it *Anophelis gambiæ*, *A. mauritanus* and *A. funestus* larvæ were found. The marsh above the road and the lower reaches of the stream harboured larvæ of *A. mauritanus* and *A. funestus* in considerable numbers along with *A. gambiæ* in smaller numbers. There were also a considerable number of Culecine larvæ found.

I consider that this area is of importance to Tanga. It is not improbable that throughout the year a few Anophelines from here reach the European quarter of the town, but, more important, it acts as a reservoir from which temporary breeding places, formed in the town after rains, may easily become populated. In this respect *Anophelines gambiæ* is the important species.

I recommend that careful levels be taken in the area, that the main stream be cleaned and straightened as far as compatible with its gradients being kept uniform, and that a set of side drains be put in to drain the area. On the west side of the south part of the area the end of these drains should form contour drains where required to cut off the seepage from the bank. If the original capital outlay is available it would be much more satisfactory and cheaper in the long run to put down agricultural tile drains for these side drains. The outlet to the sea under the Mombasa road should be lowered as far as is possible and should be provided with a tidal valve. The first inspection of the area was made at the beginning of the survey, and a second search was made in December. On the second occasion the same species were collected as on the first visit, but Anophelines were rather more numerous.

In the Minch area the chief breeding places lie alongside the railway. The drains at the side of the railway are wide and have not a graded fall, with the result that pools form in them. The drains were mostly dry, however, at the time of the inspection, and only at one place were Anopheline larvæ found, viz., *A. gambiæ*, in a pool near to where the drain runs under the line by a culvert. The rice fields, which lie on both sides of the railway, and the pond to the east of the railway were dry, but after rain it is likely that Anopheline breeding in this area will be considerable.

Apart from attention to the railside drains and the culvert in question I cannot recommend any permanent work, not having seen the area after long rains. I am inclined to think, however, that any measures other than temporary ones, such as the use of larvicides on the parts nearer the town would not be justifiable. This would have to be thorough on the parts selected, especially so before and during the rains, in order to check the spread into the town of Anopheline breeding.

The Pangani road area consists of a slight depression, barely amounting to a valley, which crosses the road and continues more or less irregularly to the south of the Native quarter. Apart from a very few wells and water-holes, the water level in which varied down to about 25 ft. at the time of inspection, the area was dry. The only collection of larvæ was made in the cattle watering hole near the road. Here *Anophelines gambiæ* larvæ and some Culecine larvæ were collected. The small pit at the end of the Native quarter, and probably a few other small depressions, might be filled in, but otherwise I cannot recommend other than temporary measures in this area. These should be more carefully applied at the parts near the town, and with a view to preventing, as far as possible, the spread of Anopheline breeding into the town during the wet weather.

Culecines found at Tanga were as follows :—

Culex decens, Theo.

„ „ var. *invidiosus*, Theo.

„ *annulioris*, Theo.

„ *bitæniorhynchus*, Giles.

„ *univittatus*, Theo.

„ *simpsoni*, Theo.

„ *duttoni*, Theo.

„ *fatigans*, Wied.

„ (*Culiciounjia*) *nebulosus*, Theo.

„ (*Micrædes*) *inconspicuosos*, Theo.

Lutzia tigris, Grp.

Ædes (*Ædimorphus*) *albocephalus*, Theo.

„ (*Stegomyia*) *argenteus*, Poir.

„ (*Ædimorphus*), sp. probably new.

This last species belongs to the "Domesticus group" as defined by Edwards (1), and appears to be most closely related to *A. minutus*, Theo., but may be readily distinguished from it by the absence of the "characteristic thoracic coloration," including the two small white spots on the mesonotum (2) or by the difference of the claspers of the male as figured by Edwards (3). Only a single male of this species was obtained in Kisosoro on my first inspection of that area. On the second inspection none of the larvæ obtained were of the species in question.

Muheza.

The breeding places at Muheza comprise the streams and drains in the neighbourhood, particularly in the Muheza Sisal Estate and the stream coming down to the east end of the village (where it spreads out to form a small marsh) and the River Mkulumusi. The larvæ are found in the slow running parts of these streams and rivers. A large pool filled with water (and reputed by Natives to contain crocodiles) at the north side of the station also contained larvæ.

A. mauritanus was the most common Anopheline in the streams with *A. funestus* next in number. Only a few *A. gambiæ* were collected. The same distribution applied to the swampy part to the east of the village. The river yielded a very few *A. funestus*, while the pool east of the station yielded *A. mauritanus* in numbers.

The breeding in the streams and river could be reduced or eliminated by straightening and cleaning the banks, but I do not think it an economic proposition in present conditions. The swamp to the east of the town might be improved by cutting the sides of the stream so as to make it keep to a clearer course, but, considering the fact that during and after the rains pools are widespread in the area, and that in a Native community without direct European supervision, the suppression of Anopheline breeding would be a thing beyond hope of accomplishment, it is not recommended that any major works be undertaken here.

The Culecines found at Muheza comprised :

- Culex decens*, Theo.
- „ „ „ var. *invidiosus*, Theo.
- „ *annulioris*, Theo.
- „ *bitæniorhynchus*, Giles.
- „ *univittatus*, Theo.
- „ *duttoni*, Theo.
- Lutzia tigripes*, Grp.
- Ædes* (*Ædimorphus*) *albocephalus*, Theo.

Amani.

The Amani district was searched in September, 1928, and when I was on local leave in January, 1929, the breeding places were again gone over. The results were interesting in that three species, viz., *A. gambiæ*, *C. bitæniorhynchus* and *C. annulioris* were not found at all in September, while in January they were fairly common.

The following account covers both visits :—

The breeding places were found to consist of the Dodwe River and the streams which join it. The latter are in some cases deflected so as to serve for the watering of gardens. In the banana patch and the wet land adjoining below the path to the water supply I collected larvæ of :—

- Anopheles marshalli*, Theo.
- „ *natalensis*, H. & H.
- „ *rhodesiensis*, Theo.
- Culex decens*, Theo.
- „ „ „ var. *invidiosus*, Theo.
- Lutzia tigripes*, Grp.
- Eretmopodites chrysogaster* Graham (from the fallen leaves).

In the “Bustani,” including the vegetable garden, I found larvæ of :—

- Anopheles marshalli*, Theo.
- „ *rhodesiensis*, Theo.
- „ *gambiæ*, Giles.
- Culex decens*, Theo.
- „ „ „ var. *invidiosus*, Theo.
- „ *bitæniorhynchus*, Giles.
- Ædes* (*Ædimorphus*) *albocephalus*.
- Lutzia tigripes*, Grp.
- Urantænia neireti*, Edw.

In small streams and drains entering the Dodwe River other than those in the garden and in the Dodwe River itself, I got the larvæ of :—

- Anopheles marshalli*, Theo.
- „ *natalensis*, H. & H.
- „ *rhodesiensis*, Theo.
- „ *gambiæ*, Giles (on one occasion only).

An *Anopheles* sp. undetermined and probably new, of which one ♀ only was obtained.

- Culex decens*, Theo.
- „ „ „ var. *invidiosus*, Theo.
- „ *simpsoni*, Theo. (only in Zigi River near Zigi).
- „ *trifilatus*, Edw.
- Culex annulioris*, Theo.
- Ædes* (*Ædimorphus*) *lamborni*, Edw.
- „ „ *albocephalus*, Theo.

Beyond these collections I found by chance in artificial water collections :—

- Ædes* (*Stegomyia*) *argenteus*, Poir.
- Culex* (*culiciomyia*) *nebulosus*, Theo.

And a *Culex* sp. allied to *C. decens*, T., but which I have not yet determined.

During my stay at Amani mosquitoes were not at all troublesome by their biting. There have been a number of malaria cases at Amani, at least one or two of which are original infections. The infections seemed to occur in the warmer and drier part of the year. The determination of the vector puzzled me at first as none of the *Anopheles* sps. found on my September visit have been incriminated as malaria vectors as far as I can gather from the literature. The finding of *A. gambiæ*, however, on my second visit, supplied the solution, as this species is the most troublesome vector of malaria in the Territory. The species had already been found in the lower land at Muheza, and the finding of it at Amani during my second visit in the hot weather along with *C. annulioris* and *C. bitæniorhynchus*, seems to point to the conditions being suitable for it only in the warmer weather. The other two species mentioned occur commonly with *A. gambiæ* in open drains on the coast.

The control of Anophelines at Amani which I advise is: Firstly, the clearing of edges of the water furrows in the gardens and the straightening of their courses as far as possible. The replacement, however, of the Native type of irrigation, which appears to be practised at present, by a definitely planned system, with subsoil drainage, would get rid of the trouble altogether as the water should not get opportunity to form pools for as long as a week at a time. The greater productivity of such a system itself would, I feel sure, pay for its installation, apart from its value as an anti-Anopheline measure.

The streams and the river are a more difficult proposition, but, fortunately, of much less importance, as on only one occasion was a collection of *A. gambiæ* larvæ found therein, and that consisted of only two larvæ.

The control of these breeding places would imply a weekly search of the river and its side streams and the oiling of any pools left at the edges or on the rocks. The actual breeding places vary with the amount of water in the river and streams, different small pools being left and gradually drying out as the waters retreat.

There are never many breeding places in action at once, and as the number of mosquitoes produced is so small as to be of no importance provided that they are not malaria vectors, I do not think that this work would be justified on my present findings.

The foregoing remarks apply to dry season conditions only. I have not seen Amani during rains, but I would not be surprised if the pools and wet areas which form provide additional breeding places for *A. gambiæ*. During such time it will be advisable (a) to keep a sharp look out for any such mosquito breeding and check it at once by the use of larvicides, and (b) for the European population, which now amounts to over 30 all told, to be particularly careful to observe at this time precautionary measures, such as the use of mosquito boots, nets and prophylactic quinine. If these recommendations are adopted and put in practice with efficiency I think that there is not much chance of further infections occurring in Amani. All other estates in the district, however, are, perhaps, not so fortunately situated, and although I have not inspected breeding grounds in their vicinity, I have seen places that look as if they would be troublesome, and, therefore, it may not be out of place to put a word of warning in this report that members of the Amani staff visiting the neighbourhood be very careful of the precautionary measures mentioned above.

Muyussi.

The breeding places at Muyussi comprise the river and small side streams and drains, many of which dry out leaving pools. In these breeding places were found:—

- Anopheles gambiæ*, Giles.
- „ *funestus*, Giles.
- „ *mauritanus*, Grp.
- Culex annulioris*, Theo.
- „ *bitæniorhynchus*.
- „ *decens*, Theo.
- „ „ „ var. *invidiosus*, Theo.

Culex fatigans, Wied.
 „ *univittatus*, Theo.
 „ (*Micrædes*) *inconspicuus*, Theo.
Lutzia tigris, Grp.
Mimomyia mimomyiaformis, Newst.

The breeding places are fairly widespread, and though not very numerous, the total number of mosquitoes hatched out in the district at certain times must be considerable. After the rains when water is lying about I would expect a large increase in the numbers of *A. gambiæ*. I can advise no control measures which would be economic propositions in present conditions.

Korogwe.

My first visit to Korogwe was made at the end of October ; at that time the only possible breeding place was the river. A search of this gave *A. gambiæ* and a few of *A. funestus*. That was at the end of a long, dry spell and the marsh in the town was dry, an occurrence which I am given to understand, is unusual. I returned to Korogwe after the short rains, such as they were, at the end of November. The marsh then had some water in it and was found to be a suitable breeding place for the two *Anopheles* mentioned above, both of which occurred in numbers. The land between the railway and the river east of the town also contained pools in which these species were collected.

The following Culecines also occurred :—

Culex univittatus, Theo.
 „ *decens*, Theo.
 „ *annulioris*, Theo.
 „ *bitæniorhynchus*, Giles.
 „ *fatigans*, Wied.
Edes (*Edimorphus*) *albocephalus*, Theo.

Owing to its low-lying situation Korogwe is a bad mosquito place after rains. I advise that careful levels be taken of the marsh area with a view to the possibility of its being drained. The present drainage system in it is not sufficient to prevent *Anopheline* breeding. After rains only rigorous inspection and careful oiling will keep Korogwe clear of *Anophelines*.

Mombo.

Mombo has more extensive breeding grounds than any other place examined on this safari.

The Mzimba River contained a few larvæ of *A. gambiæ*, *A. funestus* and *A. mauritanus*, but no larvæ were found in the Mkomazi River.

The extensive breeding ground, however, is the marsh which extends to a width of about $1\frac{1}{2}$ miles for about $3\frac{1}{2}$ miles long the west side of the railway. This is partly cultivated by Natives, who use the streams in it for irrigation. This area is not very densely populated by larvæ, but on account of its large size the total number of mosquitoes produced must be immense. Mombo is badly infected with mosquitoes, and has long been known as a malarious place. The species which are bred out from the collections were :—

Anopheles gambiæ, Giles.
 „ *funestus*, Giles.
 „ *mauritanus*, Grp.
 „ *rhodesiensis*, Theo.
Culex fatigans, Wied.
 „ *pipiens*, L.
 „ *duttoni*, Theo.
 „ *univittatus*, Theo.
 „ *watti*, Edw.

- Culex (Culiciomyia) nebulosus*, Theo.
 „ (*Micrædes*) *inconspicuus*, Theo.
Eretmopodites chrysogaster, Graham.
Lutzia tigripes, Grp.
Ædes (Banksinella) lineatopenis, Ludlow.
 „ (*Stegomyia*) *soleatus*, Edw.
 „ (*Ædimorphus*) *albocephalus*, Theo.

The control of the breeding of Anophelines at Mombo would be a very difficult matter in present conditions. Most of the marsh land, however, would be a piece of very good agricultural land if drained, the water supply for irrigation is available and the railway is at hand for transport. If this area of land were laid out under a modern irrigation scheme most of the present mosquito breeding would be automatically controlled. I am inclined to think that as the development of the country goes on this will occur sooner or later.

While I was at Mombo some of the short rains fell, and from what I saw of the results of a very little rain I believe that pool formation and the breeding of *A. gambiæ* and other species must be very much increased during and after long rains. To attempt control measures under present conditions would not be feasible. Europeans arriving at the station at night should take every precaution against being bitten, and the station rest room should be mosquito gauzed and have mosquito gauzed porch entrance, with strongly sprung doors.

Mkomazi.

At the time of my visit Mkomazi was very dry. The river was reduced to a series of pools and eventually faded out altogether. It appears from local information that this dryness was not merely a matter of the dry season, but that that part of the country was becoming drier, Lake Manka, six miles south of Mkomazi, which is marked on the map as measuring nearly a mile each way, being dried up and the "flourishing fishing industry" which once existed there being now non-existent. I collected in the river pools and in a few pools in channels near the river:—

- Anopheles gambiæ*, Giles.
 „ *mauritanus*, Grp.
 „ *funestus*, Giles.
Culex annulioris, Theo.
 „ *fatigans*, Wied.
 „ *univittatus*, Theo.
 „ *simpsoni*, Theo.
Ædes (Ædimorphus) albocephalus, Theo.

None of the species were, however, plentiful, and much of the water seemed to be devoid of larvæ. After the rains breeding near the river may be increased, but I am not prepared to guess the extent.

Same.

Same, when visited, was quite dry. The only water was that at the spring which provides the railway supply and the overflow of which provides water for cattle and goats before sinking away into the ground. This spring is about a mile to the north of the railway. The only larvæ got therein were a few *A. rhodesiensis* and a few *Ædes* larvæ in a small collection of dirty water in a foot mark. The latter were not determined.

Moshi.

The only water at Moshi was that which comes from springs, of which there are many. The water from these springs forms numbers of small streams which run chiefly in artificial channels made to supply water for running over the land by way of irrigation. The time of my visit being the driest time of the year, the water was being diverted frequently and its flow in the furrows was continually changing or stopping altogether.

This circumstance kept mosquito breeding very low, and collections of larvæ were small and far between. The species found were :—

Anopheles gambiæ, Giles.
 „ *funestus*, Giles.
 „ *mauritanus*, Grp.

Culex annulioris, Theo.

„ *decens*, Theo.

„ „ „ var. *invidiosus*, Theo.

„ *univittatus*, Theo.

Ædes simpsoni, Theo., breeding in the leaf bases of a member of the Colocaceæ.

There are two chief springs areas near Moshi. The more important, because of its proximity, is the Njoro area, which extends up to within 200 yards of the railway. The Msaranga area is four miles from Moshi, and is thus less important from the point of view of Moshi township, but supplies considerable numbers of malaria cases to the Native Hospital and is known as a very malarious area. That mosquito breeding must increase during and after rains in these areas is certain, but as to the species which increase most I am not prepared to offer any opinion. I have arranged with the Sanitary Superintendent at Moshi to have collections of larvæ made by the mosquito finders at Moshi and Arusha bred out and the resulting adults sent to Dar-es-Salaam once per month. From these I may be able to form a better idea of the conditions at other seasons than the dry one.

The control of mosquitoes in this area presents a very different problem. The Natives are dependent on these springs for their livelihood and the prevention of the irrigation practice would cause at once local food scarcity, and so is not feasible. Some good could be done if, by co-operation with the Agriculture Department, the area could be re-planned so that the irrigation and drainage could be worked out on a more definite scheme planned with the double view of a greater productivity and mosquito control. At the same time a few small permanently wet and at present neglected parts could be reclaimed. This undertaking would be a difficult one owing to the size of the area, the irregularity of surface and lack of uniformity of the land and the present holdings of the Natives, considered along with their natural inertia.

The entomologist of the Agriculture Department, who was in Moshi at the time of my visit, and who had been in Moshi before the present water supply was installed, informed me that the mosquito conditions had been much improved when the present supply spring was impounded and its overflow on to the neighbouring land reduced.

Arusha.

The breeding places in Arusha consisted of the Temi River and occasionally the water furrows. Mosquitoes were not plentiful and the continual alteration of the water flow in the furrows kept these almost free from larvæ.

The species found were :—

Anopheles cinereus, Theo.

„ *pretoriensis*, Theo.

Culex annulioris, Theo.

„ *decens*, Theo., var. *invidiosus*, Theo.

„ *simpsoni*, Theo.

A *Culex* species, probably new, but only a single specimen of a female was obtained.

As far as I can judge from a visit to Arusha at the driest time of the year, I do not think there is any Anopheline problem there.

Railway Passengers.

With regard to the chance of passengers in the trains becoming infected with malaria on the railway I think the position is as follows. There is a chance of Anophelines boarding the trains at several stations on the line: the worst being Muheza, Korogwe and Mombo. The first two of these are not of importance at present owing to time-table

arrangements. Passengers on trains should therefore be particular to avoid being bitten. From my own limited observation the use of mosquito boots and mosquito nets on the trains is very exceptional. Considering (a) that relatively little time is spent in the trains by the average man, (b) that the chances mosquitoes have to enter trains are not great as compared with those of entering houses, and (c) that care in taking the necessary precautionary measures would almost eliminate the danger of infection, I do not think that there is any call to adopt anti-Anopheline measures in parts of the country through which the railway passes if these measures are not necessitated by the health of the district itself.

During and for a month after the rains it would perhaps add to the comfort of passengers and reduce the probability of infection of the careless if the corners and the space under the seats of carriages were sprayed with an insecticide of the "Flit" type once per journey up in the early evening, and say an hour to half an hour before the train leaves Moshi for the journey down.

REFERENCES.

- (1) *Bull. Ento. Res.*, Vol. XV, p. 266.
- (2) Theobald: *Monograph of the Culicidæ*, Vol. I, pp. 319-20.
- (3) *Bull. Ento. Res.*, Vol. VII, p. 220.

DENTAL REPORT FOR THE YEAR 1928.

Mr. H. M. Fisher, Dental Surgeon, was on duty at Dar-es-Salaam from the beginning of the year until September, when he proceeded on vacation leave and handed over his duties to Mr. A. S. Newton.

The operations performed during this time are shown below and refer to Government officials and their families.

The scalings shown refer to cases of pyorrhœa treated; simple scaling is carried out as a routine measure and is not recorded.

Dodoma and Tabora were visited in June; these stations were used as centres for treatment and officials from Tukuyu, Iringa, Mpwapwa, etc., attended at Dodoma, whilst others from Kigoma, Mwanza came to Tabora.

Recommendations were again made, as in 1927, for further assistance, a dental surgeon and mechanic having been asked for.

The staff at present consists of two dental surgeons, one stationed at Tanga, and one at Dar-es-Salaam, but on account of leave there is at times only one dental surgeon on duty in this vast Territory; actually this year the Territory has only had the services of its two dental surgeons at the same time for two months of the year, that is to say, for the remaining ten months of the year one dental surgeon's services have been available.

A great deal of the dental surgeon's time is spent in doing mechanical work, time which could be well spent doing dental surgery if a mechanic were appointed; although this appointment would not permit the officer to do more travelling, since it is now necessary that a dental surgeon should be permanently stationed in Dar-es-Salaam, yet it would permit him to undertake many duties which urgently require attention, such as the efficient treatment of the Native school children, the Native population, K.A.R. and police askaris, the gaol and the teaching of Native dispensers how to extract teeth.

The Native children at the Dar-es-Salaam school were all examined during the year, and although many of these children had been treated before, they still required a great deal of attention, as shown:—

Children examined..	..	..	..	..	..	..	..	378
„ requiring treatment	..	..	..	..	..	..	..	235
Teeth requiring extraction	..	..	..	..	..	..	..	185
Permanent teeth requiring filling	..	..	..	..	..	..	..	393
Children requiring scaling	..	..	..	..	..	..	..	44

Most of the extractions have been done, with excellent results, under ethyl chloride, administered by Dr. Clarke.

It is regretted that time did not permit the fillings to be undertaken.

Numbers of Natives from the various Government Departments, the town, the K.A.R. and police lines have been treated, as also numbers of prisoners from the gaol; the treatment has been mainly surgical, although some fillings have been done.

The X-ray equipment, purchased in 1925, continues to give excellent results, and is in constant use; it has been of the greatest help to the dental surgeon, and it is hoped, of benefit to the patients generally.

Dr. Parry has given ready help in giving the anæsthetics, often at very short notice, and in arranging beds in the hospital for patients requiring large numbers of teeth extracted.

Below is a summary of the actual work carried out :—

Attendances	..	..	..	..	..	..	..	..	1,567
Fillings	..	..	..	..	..	..	..	..	601
Extractions	..	..	..	..	..	..	..	..	342
Scalings	..	..	..	..	..	..	..	..	81
Dentures made	..	..	..	..	..	..	..	..	66
Repairs to dentures	..	..	..	..	..	..	..	..	82
Radiograms taken	..	..	..	..	..	..	..	..	281
Root fillings	..	..	..	..	..	..	..	..	65
Pulp treatment	..	..	..	..	..	..	..	..	8

RETURNS.

TABLE I.

Medical Staff.—Disposition of as on 31st December, 1928.

NAME AND QUALIFICATIONS.	RANK.	STATION.	REMARKS.
J. O. SHIRCORE, C.M.G., M.B., Ch.B. (Edin.), L.R.C.P., L.R.C.S. and L.R.F.P.S. (Edin. and Glas.), M.R.C.P. (Edin.).	D.M.S.S.	Dar-es-Salaam.	
J. PUGH, M.R.C.S. (Eng.), L.R.C.P. (Lond.).	D.D.M.S.	"	
A. H. OWEN, B.A. (Camb.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), D.T.M. and H. (Camb.).	D.D.S.S.	"	
P. A. CLEARINKIN, M.B., B.Ch., B.A.O. (Belf.), D.P.H. (Irel.).	D.D.L.S.	"	
J. F. CORSON, M.B.E., M.D., Ch.B. (Manch.), D.P.H., D.T.M. and H. (Cantab.).	Asst. Bacteriologist	On leave.	
J. W. MCHARDY, B.Sc.	Entomologist ..	Dar-es-Salaam.	
W. WHITLEY, B.A. (Oxon.), A.I.C. ..	Analytical Chemist	"	
T. H. SUFFERN, M.B., B.A.O., Ch.B. (Roy. University, Irel.).	S.M.O.	Tabora.	
C. L. IEVERS, L.R.C.S., L.R.C.P. (Edin.), D.T.M. (Liv.), L.R.F.P.S. (Glas.).	"	Tanga.	
G. R. C. WILSON, M.R.C.S. (Eng.), L.R.C.P. (Lond.).	"	Mwanza.	
J. H. PARRY, B.A. (Cantab.), M.R.C.S. (Eng.), L.R.C.P. (Lond.).		Dar-es-Salaam.	
R. R. SCOTT, M.C., M.B., B.S. (Durham), M.R.C.S. (Eng.), L.R.C.P., D.P.H. (Lond.).	Senior Health Officer.	On leave.	
R. NIXON, M.B., Ch.B., D.T.M., D.P.H. (Liv.).	" ..	Tanga.	
H. H. B. FOLLIT, M.A. (Cantab.), M.R.C.S. (Eng.), L.R.C.P. (Lond.), D.P.H. (Camb.).	" ..	Dar-es-Salaam.	

RETURNS—*continued.*TABLE I—*continued.**Medical Staff.*—Disposition of as on 31st December, 1928—*continued.*

NAME AND QUALIFICATIONS.	RANK.	STATION.	REMARKS.
G. MACLEAN, M.B.E., M.B., Ch.B. (Glas.), D.T.M. (Liv.).	Sleeping Sickness Officer.	Tabora.	
A. McA. BLACKWOOD, M.B., Ch.B. (Glas.).	Medical Officer ..	On leave.	
C. H. PHILIPS, L.M.S.S.A. (Lond.) ..	" ..	Moshi.	
G. A. WILLIAMS, M.R.C.S. (Eng.), L.R.C.P. (Lond.).	" ..	Morogoro.	
W. H. DYE, M.R.C.S. (Eng.), L.R.C.P. (Lond.), L.D.S., R.C.S. (Eng.), D.T.M. and H. (Lond.).	" ..	Tukuyu.	
C. F. SHELTON, M.D., L.R.C.P. (Lond.), M.R.C.S. (Eng.), B.S. (Lond.), D.T.M. and H. (Lond.).	" ..	Iringa.	
A. I. MEEK, L.R.C.P., L.R.C.S., D.P.H. (Edin.), L.R.F.P. and S. (Glas.).	Health Officer ..	Dar-es-Salaam ..	Acting Health Officer.
J. J. B. EDMOND, M.C., M.D., Ch.B. (Edin.), D.T.M. and H. (Lond.).	Medical Officer ..	Tabora Province ..	Sleeping Sickness Duty.
A. R. LESTER, M.B., B.S. (Bombay), F.R.F.P.S. (Glas.), D.P.H., D.T.M. and H. (Edin.).	" ..	Kahama ..	Maternity and Child Welfare.
W. K. CONNELL, M.B., Ch.B. (Glas.), F.R.C.S. (Eng.).	" ..	Dar-es-Salaam ..	
F. R. LOCKHART, M.B., Ch.B. (Manch.).	" ..	Tabora.	
D. V. LATHAM, B.A., M.B., Ch.B., B.A.O. (Dub.).	" ..	Kilosa.	
T. LANGAN, M.B., Ch.B., B.A.O. (Dub.).	" ..	Dar-es-Salaam.	
H. FAIRBAIRN, M.B., Ch.B. (Glas.) ..	" ..	Ufipa ..	Sleeping Sickness duty.
J. WILLIAMSON, M.B., Ch.B. (Edin.)	" ..	Lushoto.	
C. R. STEEL, M.R.C.S. (Eng.), L.R.C.P., D.T.M. and H. (Lond.).	" ..	Kigoma.	
J. W. GRAHAM, M.C., M.A., M.D., Ch.B. (Glas.).	" ..	Dodoma.	
R. C. SPEIRS, M.B., Ch.B. (Edin.) ..	" ..	Arusha.	
J. S. ARMSTRONG, M.C., B.A., M.B., B.Ch., B.A.O. (Dub.).	" ..	On leave.	
H. J. O'D. BURKE-GAFFNEY, M.B., B.Ch., B.A.O. (Dub.).	" ..	Dar-es-Salaam ..	Attached Laboratory.
R. MACKAY, M.B., Ch.B. (Aberd.) ..	Health Officer ..	Tabora.	
B. O. WILKIN, M.B., Ch.B. (Edin.) ..	Medical Officer ..	Kondoa.	
A. MCKENZIE, M.B., B.S. (Lond.), D.T.M. and H. (Lond.), L.M.S.S.A.	" ..	Songea.	
G. S. P. NOBLE, M.B., Ch.B. (Glas.) ..	" ..	On leave.	
L. A. WILLMOTT, M.R.C.S. (Eng.), L.R.C.P. (Lond.).	" ..	"	
I. SANDERSON, M.B., Ch.B. (Edin.), D.T.M. and H. (Liv.).	" ..	Lindi.	
D. A. SKAN, M.R.C.S. (Eng.), L.R.C.P. (Lond.), D.T.M., D.T.H. (Liv.).	" ..	On leave.	
B. A. COGHLAN, M.B., Ch.B., B.A.O. (Dub.), D.T.M. (Liv.).	" ..	Liwale Area ..	Sleeping Sickness duty.
W. J. AITKEN, M.B., Ch.B. (Glas.), D.T.M. and H. (Liv.).	" ..	On leave.	
H. N. DAVIES, M.B., Ch.B. (Edin.), D.T.M. (Liv.).	" ..	Kibongoto ..	Tuberculosis duty in Moshi district.

RETURNS—*continued.*TABLE I—*continued.**Medical Staff.*—Disposition of as on 31st December, 1928—*continued.*

NAME AND QUALIFICATIONS.	RANK.	STATION.	REMARKS.
P. S. BELL, M.R.C.S. (Eng.), L.R.C.P. (Lond.).	Medical Officer ..	On leave	Sick leave.
J. H. McDONALD, M.B., Ch.B. (Aberd.).	"	"	
J. HARKNESS, L.R.C.P., L.R.C.S. and L.R.F.P.S. (Edin. and Glas.), L.D.S., R.C.S. (Edin.).	"	Bukoba.	
MISS M. HARVEY CLARKE, M.R.C.S., L.R.C.P. (Eng.), D.P.H. (Lond.).	"	Dar-es-Salaam.	
C. WILCOCKS, M.B., Ch.B. (Victoria)	"	Runzewe (Kahama)	Maternity and Child Welfare.
S. E. THEIS, M.R.C. (Eng.), L.R.C.P. (Lond.).	"	Ufipa	Sleeping Sickness duty.
C. J. MACQUILLAN, B.A., M.B., Ch.B., B.A.O. (Dub.).	"	Maswa	"
A. V. CLEMMY, M.B., Ch.B. (Oxon.), M.R.C.S., L.R.C.P. (Lond.).	"	Dar-es-Salaam ..	Port Health Officer.
D. E. WILSON, M.B., Ch.B.	Health Officer ..	Mwanza.	
J. B. C. MADGE, M.B., Ch.B.	Medical Officer ..	Singida.	
F. V. ADAMS, M.B., Ch.B. (Glas.) ..	"	Tanga.	
K. EDMUNDSON, M.B., Ch.B.	Health Officer ..	Lindi.	
H. M. FISHER, L.D.S., R.C.S. (Eng.)	Dental Surgeon ..	On leave.	
A. S. NEWTON, L.D.S. (Liv.)	"	Dar-es-Salaam.	
MISS F. M. PLANT	Matron	"	
MISS J. FRASER	Senior Nursing Sister.	Tanga.	
MISS E. L. KEMSLEY, R.R.C.	"	On leave.	
MISS E. BISHOP	"	Tabora.	
MISS M. DONALD	"	Dar-es-Salaam	
MISS B. G. ALLARDES	Sister and Health Visitor.	Kahama	Maternity and Child Welfare.
MISS A. L. RYDER	"	Nzega	"
MRS. M. M. MAKINS	"	Moshi (Machame) ..	"
MISS E. NEALE	"	Tanga	"
MISS C. KEMP	"	Tabora	"
MISS M. B. CRAIG	"	Dar-es-Salaam ..	"
MISS M. V. McILROY	"	"	"
MISS A. A. HOWORTH	"	"	"
MISS E. ASHBERRY	"	Mwanza	"
MISS M. L. E. AVANT	"	Moshi (Machame) ..	"
MISS M. B. H. MACRAE	Nursing Sister ..	Moshi.	
MISS K. THOMPSON	"	Dodoma.	
MISS A. MUNCASTER	"	Dar-es-Salaam.	
MRS. M. K. TURNLEY	"	On leave	
MRS. E. L. EVANS	"	"	
MISS E. HASLETT	"	"	
MISS K. P. HECKFORD	"	"	
MISS D. A. PORTER	"	Dar-es-Salaam.	
MISS E. B. CRICHTON	"	"	
MISS M. KAY	"	Lindi	
MISS G. D. UNDERWOOD	"	Dar-es-Salaam.	
MISS J. D. LEIGHTON	"	Tanga.	
MISS M. ANDREWS	"	"	
MISS E. M. HAYWARD	"	"	
MISS R. V. G. DAYE	"	Mwanza.	
MISS J. L. VAUX	"	Tabora.	
MISS M. TAYLOR	"	Arusha.	
MISS L. M. BISHOP	"	Dar-es-Salaam.	
MISS B. EAGER	"	"	
MISS J. TURNBULL	"	"	

RETURNS—*continued.*TABLE I—*continued.**Medical Staff.*—Disposition of as on 31st December, 1928—*continued.*

NAME AND QUALIFICATIONS.	RANK.	STATION.	REMARKS.
Miss M. C. FERGUSON	Nursing Sister ..	Dar-es-Salaam.	
Miss M. H. MacDONALD	" " ..	" "	
B. G. PANDIT, L.C.P. and S. (Bombay)	Asst. Surgeon ..	Bukoba.	
D. A. PURANDARE, L.C.P. and S. (Bombay).	Senior Sub-Asst. Surgeon.	On leave.	
Y. L. MOOLE, L.C.P. and S. (Bombay)	" " ..	Nzega.	
C. K. BORSADA, L.C.P. and S. (Bombay).	Sub-Asst. Surgeon	Tanga.	
P. S. PARANJPE, L.C.P. and S. (Bombay).	" "	On leave.	
J. F. MACEDO, L.C.P. and S. (Bombay).	" "	"	
Y. B. KELSHIKER, L.C.P. and S. (Bombay).	" "	Bagamoyo.	
M. C. K. THOMAS, L.M.S.M.G. (Trav.)	" "	On leave.	
G. V. SAKRIKER, L.C.P. and S. (Bombay).	" "	Mwanza.	
B. K. CHRISTIAN, L.C.P. and S. (Bombay).	" "	Tunduru.	
M. P. DAVE, L.C.P. and S. (Bombay)	" "	Arusha.	
CHUNILAL KHANNA	" "	Shinyanga.	
T. M. JOSEPH, L.M.S.S.A. (Lond.) ..	" "	Pangani.	
W. A. IRVINE, L.C.P. and S. (Bombay)	" "	On leave.	
S. R. ABHYANKAR, L.C.P. and S. (Bombay).	" "	Dar-es-Salaam.	
C. K. DESAI, L.C.P. and S. (Bombay)	" "	Utete.	
P. V. GOKHALE, L.C.P. and S. (Bombay).	" "	Kigoma.	
M. B. PANDYA, L.C.P. and S. (Bombay).	" "	Ujiji.	
L. CORO, Malta University	" "	Namanyere.	
SANT RAM, Cert. Lahore Med. School	" "	Mikindani.	
D. A. MHAISKAR, L.C.P. and S. (Bombay).	" "	Mahenge.	
HARI SINGH, L.S.M.F. (Punjab) ..	" "	Tabora.	
W. R. BOWRY, L.M.F. (Bengal) ..	" "	Dodoma.	
G. V. GODBOLE, L.C.P. and S. (Bombay).	" "	Songea.	
V. S. NIJASURE, L.C.P. and S. (Bombay).	" "	Mwanza.	
HARBAL SINGH, L.M.F. (Punjab) ..	" "	Lindi.	
G. A. MHAISKAR, L.C.P. and S. (Bombay).	" "	Kilosa.	
N. B. TOTE, L.C.P. and S. (Bombay)	" "	Tanga.	
S. E. PURAM, L.C.P. and S. (Calcutta).	" "	Bukoba.	
G. V. SANE, L.C.P. and S. (Bombay)	" "	Dodoma.	
MALUK SINGH, L.S.M.F. (Punjab) ..	" "	Morogoro.	
RAM SINGH, L.S.M.F. (Punjab) ..	" "	Kilosa.	
P. N. NAIR, L.M.P. (Madras) ..	" "	Moshi.	
HARCHARAN SINGH, L.M.P. (Cent. Prov.).	" "	Kahama	Maternity and Child Welfare.
S. W. GUPTA, L.C.P. and S. (Bombay)	" "	Kilwa.	
BASANT SINGH, L.M.P. (Agra) ..	" "	Kahama.	"
P. R. DHAVLE, I.M.D. (Poona) ..	" "	Dar-es-Salaam.	
G. K. KHOT, L.C.P. and S. (Bombay)	" "	Ufipa	Sleeping duty. Sickness
S. N. PATEL, L.C.P. and S. (Bombay)	" "	Kibondo.	

RETURNS—*continued.*TABLE I—*continued.**Medical Staff.*—Disposition of as on 31st December, 1928—*continued.*

NAME AND QUALIFICATIONS.	RANK.	STATION.	REMARKS.
M. G. PANVALKAR, L.C.P. and S. (Bombay).	Sub-Asst. Surgeon	Tabora.	Sleeping duty. Sickness
G. V. HARISCHANDRAKER, L.C.P. and S. (Bombay).	" "	Mbeya.	
P. K. DAVE, L.C.P. and S. (Bombay)	" "	Tabora.	
G. R. GORE, L.C.P. and S. (Bombay)	" "	Iringa.	
P. K. DATE, L.M.P. (Cent. Prov.) ..	" "	Mbulu.	
V. V. APTE, L.C.P. and S. (Bombay)	" "	Mpwapwa.	
JAGAT SINGH DOSANJHY, L.M.F. (Bengal).	" "	Kahama	Maternity and Child Welfare.
V. S. KANITKAR, L.C.P. and S. (Bombay).	" "	Mkalama.	
K. V. ANANTHAKRISHNAN IYER, L.M. and S. (Madras).	" "	Mafia Island.	
N. C. DANIEL, L.M.P. (Madras) ..	" "	Kahama	Maternity and Child Welfare.
S. S. NADKARNI, L.C.P. and S. (Bombay).	" "	Biharamulo.	
I. D. ABRAHAM, L.M.F. (Calcutta) ..	" "	Tanga	Attached Health Office.
M. S. REDDI, L.M.P. (Madras) ..	" "	Tabora.	
R. H. DOSHI, Hosp. Asst. Hydb. (Sind).	" "	Kahama District ..	Maternity and Child Welfare.
S. B. TULPULE, L.C.P. and S. (Bombay).	" "	Musoma.	
D. S. MAHABAL, L.C.P. and S. (Bombay).	" "	Moshi.	
R. R. JOSHI, L.C.P. and S. (Bombay)	" "	Kasulo.	
B. B. DABIR, L.M.P. (Cent. Prov.) ..	" "	Kondoa.	

PRINCIPAL CHANGES.

TRANSFERS.

Dr. C. B. B. Reid, Medical Officer to Kenya, 12th August.

Dr. J. C. R. Buchanan, Medical Officer to Somaliland, 28th June.

LEAVE OF ABSENCE.

European.

Dr. P. A. Clearkin, Deputy Director of Laboratory Service, beginning of the year till 20th April.

Dr. J. F. Corson, Assistant Bacteriologist, 23rd April till end of year.

Dr. T. H. Suffern, Senior Medical Officer beginning of the year till 8th January.

Dr. C. L. Ievers, Senior Medical Officer, beginning of the year till 19th February.

Dr. J. H. Thomson, Senior Medical Officer, 26th August till 18th November.

Dr. R. R. Scott, M.C., Senior Health Officer, 31st July till end of the year.

Dr. C. R. H. Tichborne, Medical Officer, 18th April till 28th August.

Dr. C. B. B. Reid, Medical Officer, beginning of the year till 7th July.

Dr. A. McA. Blackwood, Medical Officer, 2nd July till end of the year.

Dr. W. H. Dye, Medical Officer, beginning of the year till 29th April.

Dr. A. I. Meek, Medical Officer, beginning of the year till 27th January.

Dr. J. J. B. Edmond, Medical Officer, beginning of the year till 8th March.

Dr. T. A. Langan, Medical Officer, beginning of the year till 17th November.

Dr. H. Fairbairn, Medical Officer, beginning of the year till 28th May.

LEAVE OF ABSENCE—*continued.**European*—continued.

Dr. J. W. Graham, Medical Officer, beginning of the year till 15th June.
 Dr. R. C. Speirs, Medical Officer, beginning of the year till 8th July.
 Dr. J. S. Armstrong, Medical Officer, 10th April till end of the year.
 Dr. H. J. O'D. Burke-Gaffney, Medical Officer, beginning of the year till 20th April.
 Dr. R. Mackay, Medical Officer, beginning of the year till 20th May.
 Dr. J. C. R. Buchanan, Medical Officer, 16th January till 27th June,
 Dr. B. O. Wilkin, Medical Officer, beginning of the year till 20th July.
 Dr. A. McKenzie, Medical Officer, beginning of the year till 29th September.
 Dr. G. S. P. Noble, Medical Officer, 23rd July till end of the year.
 Dr. L. A. Willmott, Medical Officer, 17th March till 8th December.
 Dr. I. Sanderson, Medical Officer, beginning of the year till 13th October.
 Dr. H. van R. Mostert, Medical Officer, 27th April till 19th August.
 Dr. D. A. Skan, Medical Officer, 18th May till end of the year.
 Dr. W. J. Aitken, Medical Officer, 6th September till end of the year.
 Dr. D. Plum, Medical Officer, 23rd July till 29th October.
 Dr. P. S. Bell, Medical Officer, during whole of the year.
 Dr. J. H. McDonald, Medical Officer, 3rd December till end of the year.
 Mr. H. M. Fisher, Dental Surgeon, 15th September till end of the year.
 Mr. A. S. Newton, Dental Surgeon, beginning of the year till 18th May.
 Miss F. M. Plant, Matron, 26th August till end of the year.
 Miss E. L. Kemsley, Senior Nursing Sister, 27th August till end of the year.
 Miss M. Donald, Senior Nursing Sister, beginning of the year till 11th June.
 Miss A. L. Ryder, Sister and Health Visitor, 22nd March till 17th November.
 Miss K. Thompson, Nursing Sister, 8th April till 17th November.
 Miss A. Muncaster, Nursing Sister, 18th May till 11th December.
 Mrs. K. M. Turnley, Nursing Sister, 12th December till end of the year.
 Miss J. E. Wootten, Nursing Sister, 22nd March till 19th June.
 Mrs. E. L. Evans, Nursing Sister, 15th September till end of the year.
 Miss D. A. Porter, Nursing Sister, beginning of the year till 8th January.
 Miss M. C. L. Mapp, Nursing Sister, beginning of the year till 7th September.
 Miss E. B. Crichton, Nursing Sister, beginning of the year till 14th September.
 Miss M. Kay, Nursing Sister, beginning of the year till 24th June.
 Miss M. D. White, Nursing Sister, 9th January till 21st April.
 Miss G. D. Underwood, Nursing Sister, 16th December till end of the year.
 Miss A. M. Hough, Nursing Sister, 11th March till 10th August.
 Miss C. B. Robinson, Nursing Sister, 26th August till 10th December.
 Mr. C. D. Dovey, Chief Storekeeper, 24th June till 16th July.
 Mr. P. W. Morgan, Building Inspector, 6th September till end of the year.
 Mr. R. E. Owen, Sanitary Superintendent, beginning of the year till 14th July.
 Mr. Thomas Bell, Sanitary Superintendent, 14th October till end of the year.
 Mr. H. L. Bolton, Sanitary Superintendent, beginning of the year till 22nd March.
 Mr. C. Harlen, Sanitary Superintendent, beginning of the year till 19th February.
 Mr. A. Hume, Sanitary Superintendent, beginning of the year till 15th June.
 Mr. A. L. George, Sanitary Superintendent, beginning of the year till 15th June.
 Mr. H. J. Rance, Sanitary Superintendent, beginning of the year till 22nd July.
 Mr. J. Allan, Sanitary Superintendent, 20th November till end of the year.
 Mr. A. P. Moran, Sanitary Superintendent, 23rd December till end of the year.
 Mr. N. McL. Moore, Clerk, 18th April till 26th November.
 Mr. R. Kildea, Hospital Quartermaster, 18th January till 2nd September.
 Mr. J. E. Crawley, Medical Instructor, 18th April till end of the year.

Asiatic.

Mr. D. A. Purandre, Senior Sub-Assistant Surgeon, 16th October till end of the year.
 Mr. P. S. Paranjpe, Sub-Assistant Surgeon, 19th October till end of the year.
 Mr. J. F. Macedo, Sub-Assistant Surgeon, 2nd September till end of the year.

LEAVE OF ABSENCE—*continued.**Asiatic—continued.*

Mr. M. C. Thomas, Sub-Assistant Surgeon, 13th November till end of the year.
 Mr. W. A. Irvine, Sub-Assistant Surgeon, 29th October till end of the year.
 Mr. S. R. Abhyankar, Sub-Assistant Surgeon, beginning of the year till 27th February.
 Mr. P. V. Gokhale, Sub-Assistant Surgeon, beginning of the year till 26th March.
 Mr. D. A. Mhaisker, Sub-Assistant Surgeon, 1st May till 22nd October.
 Mr. Hari Singh, Sub-Assistant Surgeon, 1st May till 22nd October.
 Mr. Diwan Singh, Sub-Assistant Surgeon, 20th February till 2nd June.
 Mr. Ram Singh, Sub-Assistant Surgeon, 9th July till 5th November.
 Mr. W. R. Bowry, Sub-Assistant Surgeon, 1st June till 17th December.
 Mr. Ujagar Singh, Compounder, beginning of the year till 5th June.
 Mr. Mehtab Singh, Compounder, 11th July till 5th November.
 Mr. A. Correa, Compounder, beginning of the year till 13th February.
 Mr. M. A. Shaik, Compounder, 18th September till end of the year.
 Mr. J. B. Nathan, Compounder, 26th November till end of the year.
 Mr. S. L. Dourado, Compounder, 1st June till end of the year.
 Mr. J. X. E. Gomes, Compounder, 16th April till 13th August.
 Mr. P. J. A. Falcon, Compounder, 14th May till 10th September.
 Mr. P. V. Mathew, Compounder, 1st May till 5th November (Special leave).
 Mr. Acacio L. B. Fernandes, Special Grade Clerk, 19th March till 27th September.
 Mr. D. B. Somvasi, 2nd Grade Clerk, 24th December till end of the year.
 Mr. R. D. Pandya, 4th Grade Clerk, beginning of the year till 30th June.
 Mr. L. J. Hidris, Sanitary Inspector, beginning of the year till 1st February.

TABLE II.

FINANCIAL.

<i>Expenditure :</i>	£	£
PERSONAL EMOLUMENTS :		
<i>Medical Division :</i>		
Director of Medical and Sanitary Services	}	2,700
Deputy Director of Medical Service		
Clerical Staff, Medical Storekeepers, Medical Instructors, Packers, Messengers, etc.		
Senior Medical Officers		8,040
Medical Officers		4,340
Sleeping Sickness Officer		31,550
Dental Surgeons		1,085
Nursing Staff		1,770
Superintendent and Matron, Mental Hospital, and Hospital Quartermaster		8,080
Asian Medical Assistants, <i>i.e.</i> , Assistant Surgeons, Senior Sub- Assistant Surgeons, Sub-Assistant Surgeons and Com- pounders		1,215
African Dispensers, Hospital Orderlies and Nurses		20,305
Other Charges		7,170
		995
		<hr/> 87,250
<i>Sanitation Division :</i>		
Deputy Director of Sanitary Service and Health Officers ...		5,700
Sisters and Health Visitors, Building Inspector, Sanitary Superintendents and Subordinate Staff for the Suppression of Epidemic Diseases		17,835
		<hr/> 23,535
Carried forward		<hr/> 110,785

TABLE II—*continued.*FINANCIAL—*continued.**Expenditure*—continued.PERSONAL EMOLUMENTS—*continued.*

	£	£
Brought forward		110,785

Laboratory Division :

Deputy Director of Laboratory Service, Assistant Bacteriologist, Entomologist, Analytical Chemist, Laboratory Assistants and other personnel attached	4,105	4,105
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Total personal emoluments		114,890
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OTHER CHARGES :—

Administrative Division :

Incidental expenses	482
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Medical Division :

Miscellaneous charges	3,695
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Sanitation Division :

Cesspit Emptying Apparatus	824
Sanitary Equipment	1,521
Sanitary Labour	13,738
Sanitary Oils and Disinfectants	305
Uniforms	455

Laboratory Division :

Vaccines and Sera	382
Miscellaneous	332

Preventable Diseases, etc. :

Epidemic Outbreaks and Special Sanitary Measures	145
Leprosy and Incurables	3,544
Maternity and Child Welfare	1,072
Quarantine and Infectious Diseases Hospitals	1,767
Quinine for Public Purchase at Post Offices	1,022
Sleeping Sickness	11,461
Tuberculosis	396
Venereal Diseases and Yaws	1,004

Hospitals, Dispensaries and Mental Hospitals, Maintenance of :

Equipment, Furniture, Microscopes, etc.	6,864
Medical and Surgical Stores	19,648
Upkeep of Hospitals	15,587
Upkeep of Mental Hospitals	1,164
Uniforms	500

Miscellaneous :

Books of Reference, Periodicals and Stationery	546
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Travelling and Transport :

Box Bodies for Ambulances	104
Motor Vehicles	2,338
Motor Boats	651
Travelling Equipment	297
Transport, Railage and Passages	19,399
Upkeep of Motor Boats	336
Upkeep and Running Costs of Cars (part cost only)	58

Total other charges	109,637
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Carried forward	224,527
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TABLE II—*continued*.FINANCIAL—*continued*.

								£	£
	Brought forward					224,527
SPECIAL INVESTIGATION INTO MEDICAL AND SOCIAL CONDITIONS, KAHAMA.									
Personal Emoluments:									
	1 Medical Officer	...	...	...	...	...	...	810	
	2 Sisters and Health Visitors	...	...	...	...	...	...	650	
	4 Sub-Assistant Surgeons	...	...	...	...	...	...	865	
	2 Motor Drivers (part salaries)	13	
	20 Ayahs (Native, Female Nurses)	153	
	Total expenditure		2,491
	Total		227,018
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<i>Receipts:</i>	STATEMENT OF REVENUE, 1928.								£
	From Hospital Fees, Sale of Drugs, etc....		9,076
	Fees collected by Port and Marine Department and H.M. Customs for								
	Bills of Health	...	...	...	...	...	...		1,259
	Sale of Lymph, Vaccine and Serum	...	...	...	...	...	...		105
	Total	...	...	...	...	...	...		10,440

TABLES V AND VI.

EUROPEANS (OFFICIAL AND NON-OFFICIAL).

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
I.—Epidemic, Endemic, and Infectious Diseases.									
1. Enteric Group—									
(a) Typhoid Fever ..	—	11	—	11	1	2	—	2	13
(b) Paratyphoid A ..	—	1	—	1	—	—	—	—	1
(c) Paratyphoid B ..	—	1	1	1	—	—	—	—	1
(d) Type not defined ..	—	1	—	1	—	—	—	—	1
2. Typhus ..	—	—	—	—	—	—	—	—	—
3. Relapsing Fever ..	1	15	—	16	—	6	—	6	22
4. Undulant Fever ..	—	—	—	—	—	—	—	—	—
5. Malaria—									
(a) Tertian ..	—	113	—	113	1	34	7	41	154
(b) Quartan ..	—	3	—	3	—	5	2	7	10
(c) Aestivo-autumnal ..	5	354	—	359	6	129	65	194	553
(d) Cachexia ..	—	16	1	16	2	19	2	21	37
(e) Blackwater..	—	16	6	16	—	4	—	4	20
(f) Cerebral ..	—	2	2	2	—	—	—	—	2
(g) Unclassified ..	1	73	—	74	1	24	4	28	102
Carried forward ..	7	606	10	613	11	223	80	303	916

TABLES V AND VI—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
Brought forward ..	7	606	10	613	11	223	80	303	916
6. Smallpox	—	—	—	—	—	—	—	—	—
Alastrim	—	—	—	—	—	—	—	—	—
7. Measles	—	1	—	1	—	1	—	1	2
8. Scarlet Fever ..	—	—	—	—	—	—	—	—	—
9. Whooping Cough ..	—	1	—	1	—	1	—	1	2
10. Diphtheria	—	2	—	2	2	—	2	2	4
11. Influenza	6	143	—	149	4	47	41	88	237
12. Miliary Fever ..	—	—	—	—	—	—	—	—	—
13. Mumps	—	—	—	—	—	—	—	—	—
14. Cholera	—	—	—	—	—	—	—	—	—
15. Epidemic Diarrhœa	—	—	—	—	—	—	—	—	—
16. Dysentery—									
(a) Amœbic	—	34	—	34	—	17	3	20	54
(b) Bacillary	1	8	1	9	—	2	1	3	12
(c) Undefined or due to other causes ..	—	4	—	4	—	1	1	2	6
17. Plague—									
(a) Bubonic	—	—	—	—	—	—	—	—	—
(b) Pneumonic	—	—	—	—	—	—	—	—	—
(c) Septicæmic	—	—	—	—	—	—	—	—	—
(d) Undefined	—	—	—	—	—	—	—	—	—
18. Yellow Fever ..	—	—	—	—	—	—	—	—	—
19. Spirochætosis ictero- hæmorrhagica	—	—	—	—	—	—	—	—	—
20. Leprosy	—	—	—	—	—	—	—	—	—
21. Erysipelas	—	—	—	—	—	1	—	1	1
22. Acute Põliomyelitis ..	—	—	—	—	—	—	—	—	—
23. Encephalitis Lethar- gica	—	—	—	—	—	—	—	—	—
24. Epidemic Cerebro- spinal Fever	—	—	—	—	—	—	—	—	—
25. Other Epidemic Diseases—									
(a) Rubeola (German Measles)	—	—	—	—	—	—	—	—	—
(b) Varicella (Chicken- pox)	—	2	—	2	—	—	—	—	2
(c) Kala Azar	—	—	—	—	—	—	—	—	—
(d) Phlebotomus Fever	—	—	—	—	—	—	—	—	—
(e) Dengue	—	4	—	4	—	2	1	3	7
(f) Epidemic Dropsy ..	—	—	—	—	—	—	—	—	—
(g) Yaws	—	—	—	—	—	—	—	—	—
(h) Trypanosomiasis ..	—	—	—	—	—	—	—	—	—
(i) Rat-bite Fever ..	—	1	—	1	—	—	—	—	1
26. Glanders	—	—	—	—	—	—	—	—	—
27. Anthrax	—	—	—	—	—	1	—	1	1
28. Rabies	—	—	—	—	—	—	—	—	—
29. Tetanus	—	—	—	—	—	—	—	—	—
30. Mycosis	—	—	—	—	—	—	—	—	—
31. Tuberculosis, Pul- monary and Laryngeal	—	12	3	12	—	4	—	4	16
Carried forward ..	14	818	14	832	17	300	129	429	1,261

TABLES V AND VI—*continued.*RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
Brought forward ..	14	818	14	832	17	300	129	429	1,261
32. Tuberculosis of the Meninges or Cerebral Nervous System ..	—	—	—	—	—	1	—	1	1
33. Tuberculosis of the Intestines or Peri- toneum	—	—	—	—	—	—	—	—	—
34. Tuberculosis of the Vertebral Column ..	—	—	—	—	—	—	—	—	—
35. Tuberculosis of Bones and Joints	—	—	—	—	—	1	—	1	1
36. Tuberculosis of other Organs—									
(a) Skin or Subcuta- neous Tissue (Lupus)	—	—	—	—	—	—	—	—	—
(b) Bones	—	—	—	—	—	—	—	—	—
(c) Lymphatic System	—	—	—	—	—	—	—	—	—
(d) Genito-urinary ..	—	1	—	1	—	—	—	—	1
(e) Other Organs ..	—	—	—	—	—	—	—	—	—
37. Tuberculosis dis- seminated—									
(a) Acute	—	—	—	—	—	—	—	—	—
(b) Chronic	—	—	—	—	—	—	—	—	—
38. Syphilis—									
(a) Primary	—	—	—	—	—	7	—	7	7
(b) Secondary	—	—	—	—	—	1	—	1	1
(c) Tertiary	1	—	—	1	—	7	—	7	8
(d) Hereditary	—	1	—	1	—	—	—	—	1
(e) Period not indicated	—	—	—	—	—	—	—	—	—
39. Soft Chancre ..	—	—	—	—	—	3	—	3	3
40. A.—Gonorrhœa and its complications ..	—	1	—	1	—	26	2	28	29
B.—Gonorrhœal Oph- thalmia	—	—	—	—	—	—	—	—	—
C.—Gonorrhœal Ar- thritis	—	—	—	—	—	—	—	—	—
D.—Granuloma Venereum ..	—	—	—	—	—	—	—	—	—
41. Septicæmia	—	—	—	—	—	—	—	—	—
42. Other Infectious Diseases	—	—	—	—	—	—	—	—	—
II.—General Diseases not mentioned above.									
43. Cancer or other malig- nant Tumours of the Buccal Cavity	—	2	1	2	1	—	—	—	2
44. Cancer or other malig- nant Tumours of the Stomach or Liver ..	—	1	1	1	—	2	—	2	3
Carried forward ..	15	824	16	839	18	348	131	479	1,318

TABLES V AND VI—*continued*.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued*.

DISEASES	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
Brought forward ..	15	824	16	839	18	348	131	479	1,318
45. Cancer or other malignant Tumours of the Peritoneum, Intestines, Rectum	—	2	—	2	—	—	1	1	3
46. Cancer or other malignant Tumours of the Female Genital Organs ..	—	—	—	—	—	—	1	1	1
47. Cancer or other malignant Tumours of the Breast	—	1	—	1	—	—	—	—	1
48. Cancer or other malignant Tumours of the Skin	—	—	—	—	—	—	—	—	—
49. Cancer or other malignant Tumours of the Organs not specified ..	—	—	—	—	—	2	1	3	3
50. Tumours, non-malignant	—	2	—	2	1	8	5	13	15
51. Acute Rheumatism ..	—	1	—	1	—	4	4	8	9
52. Chronic Rheumatism ..	—	—	—	—	—	9	5	14	14
53. Scurvy (including Barlow's Disease) ..	—	—	—	—	—	—	—	—	—
54. Pellagra	—	—	—	—	—	—	—	—	—
55. Beriberi	—	—	—	—	—	—	—	—	—
56. Rickets	—	—	—	—	—	—	—	—	—
57. Diabetes (not including Insipidus)	—	—	—	—	—	—	3	3	3
58. Anæmia—									
(a) Pernicious	—	1	—	1	—	—	—	—	1
(b) Other Anæmias and Chlorosis	—	11	—	11	—	37	27	64	75
59. Diseases of the Pituitary Body ..	—	—	—	—	—	5	—	5	5
60. Diseases of the Thyroid Gland—									
(a) Exophthalmic Goitre ..	—	—	—	—	—	—	1	1	1
(b) Other Diseases of the Thyroid Gland, Myxœdema	—	—	—	—	—	—	1	1	1
61. Diseases of the Parathyroid Glands ..	—	—	—	—	—	—	—	—	—
62. Diseases of the Thymus	—	—	—	—	—	—	—	—	—
63. Diseases of the Supra-Renal Glands	—	—	—	—	—	—	—	—	—
64. Diseases of the Spleen ..	—	—	—	—	—	—	1	1	1
65. Leukæmia—									
(a) Leukæmia	—	1	—	1	—	—	—	—	1
(b) Hodgkin's Disease ..	—	—	—	—	—	1	—	1	1
66. Alcoholism	—	8	1	8	—	—	—	—	8
Carried forward ..	15	851	17	866	19	414	181	595	1,461

TABLES V AND VI—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
Brought forward ..	15	851	17	866	19	414	181	595	1,461
67. Chronic Poisoning by mineral substances (lead, mercury, etc.) ..	—	—	—	—	—	—	—	—	—
68. Chronic Poisoning by organic substances (morphia, cocaine, etc.) ..	—	—	—	—	—	—	—	—	—
69. Other General Diseases—									
Auto-intoxication ..	—	—	—	—	—	—	—	—	—
Purpura Hæmorrhagica ..	—	2	—	2	—	—	—	—	2
Hæmophilia	—	—	—	—	—	—	—	—	—
Diabetes Insipidus ..	—	—	—	—	—	1	—	1	1
Others	—	—	—	—	—	1	1	2	2
III.—Affections of the Nervous System and Organs of the Senses.									
70. Encephalitis (not including Encephalitis Lethargica)	—	—	—	—	—	—	—	—	—
71. Meningitis (not includ- ing Tuberculosis, Menin- gitis or Cerebrospinal Meningitis)	—	1	—	1	—	—	1	1	2
72. Locomotor Ataxia ..	—	—	—	—	—	—	—	—	—
73. Other affections of the Spinal Cord	—	—	—	—	—	—	—	—	—
74. Apoplexy—									
(a) Hemiplegia	—	—	—	—	—	—	—	—	—
(b) Embolism	—	—	—	—	—	—	—	—	—
(c) Thrombosis	—	—	—	—	—	—	—	—	—
75. Paralysis—									
(a) Hæmorrhage	—	2	—	2	—	—	—	—	2
(b) Other Paralyses ..	—	—	—	—	—	1	1	2	2
76. General Paralysis of the Insane	—	1	—	1	—	—	—	—	1
77. Other forms of Mental Alienation	—	2	—	2	—	—	—	—	2
78. Epilepsy	—	4	—	4	—	—	—	—	4
79. Eclampsia, Convul- sions (non-puerperal), 5 years and over ..	—	—	—	—	—	—	—	—	—
80. Infantile Convulsions ..	—	1	—	1	—	—	2	2	3
81. Chorea	—	—	—	—	—	—	—	—	—
82. A.—Hysteria	—	1	—	1	—	—	—	—	1
B.—Neuritis	—	3	—	3	—	19	6	25	28
C.—Neurasthenia	—	11	—	11	—	13	11	24	35
83. Cerebral Softening ..	—	1	—	1	—	—	—	—	1
Carried forward ..	15	880	17	895	19	449	203	652	1,547

TABLES V AND VI—*continued*.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued*.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
Brought forward ..	15	880	17	895	19	449	203	652	1,547
84. Other affections of the Nervous System, such as Paralysis Agitans ..	—	3	—	3	—	11	5	16	19
85. Affections of the Organs of Vision—									
(a) Diseases of the Eye	—	1	—	1	—	1	3	4	5
(b) Conjunctivitis ..	—	—	—	—	—	38	8	46	46
(c) Trachoma ..	—	—	—	—	—	—	—	—	—
(d) Tumours of the Eye	—	—	—	—	—	—	—	—	—
(e) Other affections of the Eye ..	—	4	—	4	—	41	16	57	61
86. Affections of the Ear or Mastoid Sinus ..	—	7	—	7	—	94	32	126	133
IV.—Affections of the Circulatory System.									
87. Pericarditis ..	—	1	—	1	—	1	—	1	2
88. Acute Endocarditis or Myocarditis ..	—	1	—	1	—	—	—	—	1
89. Angina Pectoris ..	—	3	1	3	—	—	1	1	4
90. Other Diseases of the Heart—									
(a) Valvular— ..	—	6	1	6	1	5	3	8	14
Mitral ..	—	3	—	3	—	1	—	1	4
Aortic ..	—	—	—	—	—	—	—	—	—
Tricuspid ..	—	—	—	—	—	—	—	—	—
Pulmonary ..	—	—	—	—	—	—	—	—	—
(b) Myocarditis ..	—	2	—	2	—	1	1	2	4
91. Diseases of the Arteries—									
(a) Aneurism ..	—	—	—	—	—	1	—	1	1
(b) Arterio-Sclerosis ..	—	—	—	—	—	—	—	—	—
(c) Other Diseases ..	—	—	—	—	—	—	—	—	—
92. Embolism or Thrombosis (non-cerebral) ..	—	—	—	—	—	—	—	—	—
93. Diseases of the Veins—									
Hæmorrhoids ..	—	5	—	5	—	12	3	15	20
Varicose ..	—	—	—	—	—	—	1	1	1
Phlebitis ..	—	1	—	1	—	—	1	1	2
94. Diseases of the Lym- phatic System—									
Filariasis ..	—	—	—	—	—	—	—	—	—
Lymphangitis ..	—	1	—	1	—	1	—	1	2
Lymphadenitis, Bubo (non-specific) ..	—	4	—	4	—	9	1	10	14
95. Hæmorrhage of un- determined cause ..	—	1	—	1	—	1	—	1	2
96. Other affections of the Circulatory System	—	5	—	5	—	2	2	4	9
Carried forward ..	15	928	19	943	20	668	280	948	1,891

TABLES V AND VI—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
Brought forward ..	15	928	19	943	20	668	280	948	1,891
V.—Affections of the Respiratory System.									
97. Diseases of the Nasal Passages—									
Adenoids	—	—	—	—	—	4	—	4	4
Polypus	—	—	—	—	—	1	—	1	1
Rhinitis	—	1	—	1	—	8	3	11	12
Coryza	—	15	—	15	—	55	16	71	86
98. Affections of the Larynx—Laryngitis ..	—	2	—	2	—	14	2	16	18
99. Bronchitis—									
(a) Acute	—	24	—	24	1	35	22	57	81
(b) Chronic	—	1	—	1	—	23	6	29	30
(c) Unclassified ..	—	3	—	3	—	3	1	4	7
100. Broncho-Pneumonia	—	9	—	9	—	1	—	1	10
101. Pneumonia—									
(a) Lobar	1	8	2	9	—	—	—	—	9
(b) Unclassified ..	—	—	—	—	—	—	—	—	—
102. Pleurisy, Empyema	—	6	—	6	—	4	—	4	10
103. Congestion of the Lungs	—	—	—	—	—	1	—	1	1
104. Gangrene of the Lungs	—	—	—	—	—	—	—	—	—
105. Asthma	—	3	—	3	—	6	2	8	11
106. Pulmonary Emphysema	—	—	—	—	—	—	—	—	—
107. Other affections of the Lungs—									
Pulmonary Spira- chætosis	—	—	—	—	—	—	—	—	—
Other Affections of the Respiratory System	—	1	—	1	—	3	1	4	5
VI.—Diseases of the Digestive System.									
108. A.—Diseases of Teeth or Gums—									
Caries, Pyorrhœa, etc.	—	21	—	21	—	125	32	157	178
B.—Other affections of the Mouth—									
Stomatitis	—	3	—	3	—	5	3	8	11
Glossitis, etc. ..	—	—	—	—	—	1	1	2	2
109. Affections of the Pharynx or Tonsils—									
Tonsillitis	—	56	—	56	2	39	33	72	128
Pharyngitis	—	1	—	1	—	20	4	24	25
110. Other affections of the Oesophagus ..	—	1	—	1	—	4	—	4	5
111. A.—Ulcer of the Stomach	—	4	—	4	—	—	—	—	4
B.—Ulcer of the Duodenum ..	—	2	—	2	—	1	1	2	4
Carried forward ..	16	1,089	21	1,105	23	1,021	407	1,428	2,533

TABLES V AND VI—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
Brought forward ..	16	1,089	21	1,105	23	1,021	407	1,428	2,533
112. Other affections of the Stomach—									
Gastritis	1	31	1	32	—	33	11	44	76
Dyspepsia, etc... ..	—	6	—	6	—	53	28	81	87
113. Diarrhœa and En- teritis—									
Under two years ..	—	33	—	33	—	42	19	61	94
114. Diarrhœa and En- teritis—									
Two years and over ..	—	37	—	37	—	54	23	77	114
Colitis	1	14	—	15	—	16	1	17	32
Ulceration	—	—	—	—	—	—	—	—	—
114A. Sprue	—	—	—	—	—	—	—	—	—
115. Ankylostomiasis ..	—	—	—	—	—	1	—	1	1
116. Diseases due to Intes- tinal Parasites—									
(a) Cestoda (Tænia) ..	—	8	—	8	—	—	—	—	8
(b) Trematoda (Flukes)	—	—	—	—	—	—	—	—	—
(c) Nematoda (other than Ankylostoma)	—	1	—	1	—	1	3	4	5
Ascaris	—	—	—	—	—	6	2	8	8
Trichocephalus Dispar	—	—	—	—	—	—	—	—	—
Trichina	—	—	—	—	—	—	—	—	—
Dracunculus	—	—	—	—	—	—	—	—	—
Strongylus	—	—	—	—	—	—	—	—	—
Oxyuris	—	—	—	—	—	2	—	2	2
(d) Coccidia	—	—	—	—	—	—	—	—	—
(e) Other Parasites ..	—	—	—	—	—	—	1	1	1
(f) Unclassified	—	—	—	—	—	8	7	15	15
117. Appendicitis	1	16	—	17	2	1	2	3	20
118. Hernia	—	4	1	4	—	3	—	3	7
119. A.—Affections of the Anus, Fistula, etc.	—	5	—	5	—	9	—	9	14
B.—Other affections of the Intestines									
Enteroptosis	—	—	—	—	—	—	—	—	—
Constipation	—	5	—	5	—	23	8	31	36
120. Acute Yellow Atro- phy of the Liver ..	—	—	—	—	—	—	—	—	—
121. Hydatid of the Liver	—	—	—	—	—	—	—	—	—
122. Cirrhosis of the Liver—									
(a) Alcoholic	—	—	—	—	—	—	—	—	—
(b) Other forms	—	1	—	1	—	1	1	2	3
123. Biliary Calculus ..	—	—	—	—	—	1	—	1	1
124. Other affections of the Liver—									
Abscess	—	2	—	2	—	1	—	1	3
Hepatitis	—	9	—	9	—	8	2	10	19
Cholecystitis	—	2	—	2	—	4	3	7	9
Jaundice	—	6	—	6	—	—	—	—	6
Carried forward ..	19	1,269	23	1,288	25	1,288	518	1,806	3,094

TABLES V AND VI—*continued.*RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
Brought forward ..	19	1,269	23	1,288	25	1,288	518	1,806	3,094
125. Diseases of the Pancreas	—	—	—	—	—	—	—	—	—
126. Peritonitis (of un- known cause)	—	—	—	—	—	—	—	—	—
127. Other affections of the Digestive System ..	1	14	—	15	1	14	10	24	39
VII.—Diseases of the Genito-Urinary System (Non-Venereal)									
128. Acute Nephritis ...	—	—	—	—	—	1	—	1	1
129. Chronic Nephritis ..	—	3	2	3	—	—	—	—	3
130. A.—Chyluria ..	—	—	—	—	—	1	—	1	1
B.—Schistosomiasis	—	1	—	1	—	—	—	—	1
131. Other affections of the Kidneys—Pyelitis, etc.	—	10	—	10	—	8	6	14	24
132. Urinary Calculus ..	—	6	—	6	—	2	—	2	8
133. Diseases of the Bladder—Cystitis ..	1	11	—	12	1	11	11	22	34
134. Diseases of the Urethra—									
(a) Stricture	—	3	—	3	—	5	—	5	8
(b) Other	—	1	—	1	—	8	—	8	9
135. Diseases of the Prostate—									
Hypertrophy	—	—	—	—	—	—	—	—	—
Prostatitis	—	2	—	2	—	6	—	6	8
136. Diseases (non-venereal) of the Genital Organs of Man—									
Epididymitis	1	8	—	9	1	2	—	2	11
Orchitis	—	5	—	5	—	4	—	4	9
Hydrocele	—	1	—	1	—	1	—	1	2
Ulcer of Penis	—	1	—	1	—	—	—	—	1
Phimosis	—	2	—	2	—	—	—	—	2
137. Cysts or other non-malignant Tumours of the Ovaries	—	—	—	—	—	—	—	—	—
138. Salpingitis—Abscess of the Pelvis	—	2	—	2	—	—	1	1	3
139. Uterine Tumours (non-malignant) ..	—	—	—	—	—	—	1	1	1
140. Uterine Hæmorrhage (non-puerperal) ..	—	2	—	2	—	—	11	11	13
Carried forward ..	22	1,341	25	1,363	28	1,351	558	1,909	3,272

TABLES V AND VI—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
Brought forward ..	22	1,341	25	1,363	28	1,351	558	1,909	3,272
141. A.—Metritis ..	—	1	—	1	—	—	9	9	10
B.—Other affections of the Female Genital Organs..	—	2	—	2	—	—	11	11	13
Displacement of Uterus	—	—	—	—	—	—	5	5	5
Amenorrhœa ..	—	—	—	—	—	—	3	3	3
Dysmenorrhœa ..	—	5	—	5	—	—	16	16	21
Leucorrhœa ..	—	1	—	1	—	—	—	—	1
142. Diseases of the Breast (non-puerperal)	—	—	—	—	—	—	—	—	—
Mastitis	—	4	—	4	—	2	4	6	10
Abscess of Breast ..	—	1	—	1	—	—	1	1	2
VIII.—Puerperal State.									
143. A.—Normal Labour ..	2	63	—	65	—	—	1	1	66
B.—Accidents of Pregnancy—									
(a) Abortion ..	—	10	—	10	—	—	5	5	15
(b) Ectopic Gestation	—	—	—	—	—	—	—	—	—
(c) Other accidents of Pregnancy ..	—	4	—	4	—	—	21	21	25
144. Puerperal Hæmorrhage	—	—	—	—	—	—	—	—	—
145. Other accidents of Parturition	—	3	1	3	—	—	2	2	5
146. Puerperal Septicæmia	—	—	—	—	—	—	—	—	—
147. Phlegmasia Dolens..	—	—	—	—	—	—	—	—	—
148. Puerperal Eclampsia ..	—	1	1	1	—	—	—	—	1
149. Sequelæ of Labour..	—	1	—	1	—	—	2	2	3
150. Puerperal affections of the Breast	—	—	—	—	—	—	—	—	—
IX.—Affections of the Skin and Cellular Tissues.									
151. Gangrene	—	—	—	—	—	—	—	—	—
152. Boil	—	10	—	10	—	61	16	77	87
153. Carbuncle	—	11	—	11	2	10	—	10	21
Abscess	—	26	—	26	1	40	5	45	71
Whitlow	—	—	—	—	—	8	4	12	12
Cellulitis	1	14	—	15	—	26	10	36	51
Ulcers	1	13	—	14	1	65	6	71	85
154. A.—Tinia	—	1	—	1	—	11	8	19	20
B.—Scabies	—	—	—	—	—	3	3	6	6
Carried forward ..	26	1,512	27	1,538	32	1,577	690	2,267	3,805

TABLES V AND VI—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
Brought forward ..	26	1,512	27	1,538	32	1,577	690	2,267	3,805
155. Other Diseases of the Skin—									
Erythema	—	1	—	1	—	—	—	—	1
Urticaria	—	5	—	5	—	18	9	27	32
Eczema	—	2	—	2	—	21	7	28	30
Herpes	—	1	—	1	—	2	1	3	4
Psoriasis	—	—	—	—	—	2	1	3	3
Elephantiasis	—	—	—	—	—	—	—	—	—
Myiasis	—	1	—	1	—	5	3	8	9
Chigoes	1	—	—	1	—	15	9	24	25
Cutaneous Leish- maniasis	—	—	—	—	—	1	—	1	1
Others	1	12	—	13	—	82	24	106	119
X.—Diseases of Bones and Organs of Locomotion other than Tuberculosis.									
156. Diseases of Bones—									
Osteitis	—	—	—	—	—	1	—	1	1
157. Diseases of Joints—									
Arthritis	—	7	—	7	—	16	2	18	25
Synovitis	—	7	—	7	—	10	5	15	22
158. Other diseases of Bones or Organs of Locomotion	—	24	—	24	—	48	11	59	83
XI.—Malformations.									
159. Malformations—									
Hydrocephalus.. ..	—	—	—	—	—	—	—	—	—
Spina Bifida, etc. ..	—	—	—	—	—	—	—	—	—
XII.—Diseases of Infancy.									
160. Congenital Debility	—	—	—	—	—	—	—	—	—
161. Premature Birth ..	—	—	—	—	—	—	—	—	—
162. Other affections of Infancy	—	—	—	—	—	—	4	4	4
163. Infant Neglect (in- fants of three months or over)	—	—	—	—	—	—	—	—	—
XIII.—Affections of Old Age.									
164. Senility	—	—	—	—	—	—	—	—	—
Senile Dementia ..	—	—	—	—	—	—	—	—	—
Carried forward ..	28	1,572	27	1,600	32	1,798	766	2,564	4,164

TABLES V AND VI—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
Brought forward ..	28	1,572	27	1,600	32	1,798	766	2,564	4,164
XIV.—Affections pro- duced by External Causes.									
165. Suicide by Poisoning	—	—	—	—	—	—	—	—	—
166. Corrosive Poisoning (intentional)	—	1	1	1	—	—	—	—	1
167. Suicide by Gas Poisoning	—	—	—	—	—	—	—	—	—
168. Suicide by Hanging or Strangulation ..	—	—	—	—	—	—	—	—	—
169. Suicide by Drowning	—	—	—	—	—	—	—	—	—
170. Suicide by Firearms	—	1	1	1	—	—	—	—	1
171. Suicide by Cutting or Stabbing Instruments	—	—	—	—	—	—	—	—	—
172. Suicide by Jumping from a Height	—	—	—	—	—	—	—	—	—
173. Suicide by Crushing	—	—	—	—	—	—	—	—	—
174. Other Suicides ..	—	—	—	—	—	—	—	—	—
175. Food Poisoning— Botulism	—	8	—	8	—	2	1	3	11
176. Attacks of Poisonous Animals— Snake Bite	—	1	—	1	—	1	1	2	3
Insect Bite	—	1	—	1	—	12	7	19	20
Others	—	—	—	—	—	—	—	—	—
177. Other Accidental Poisonings	—	1	—	1	—	—	—	—	1
178. Burns (by Fire) ..	—	—	—	—	—	3	—	3	3
179. Burns (other than by Fire)	—	2	—	2	—	5	—	5	7
180. Suffocation (acci- dental)	—	—	—	—	—	—	—	—	—
181. Poisoning by Gas (accidental)	—	—	—	—	—	—	—	—	—
182. Drowning (acci- dental)	—	—	—	—	—	—	—	—	—
183. Wounds (by Fire- arms, war excepted) ..	—	4	—	4	—	1	—	1	5
184. Wounds (by Cutting or Stabbing Instru- ments)	—	6	—	6	—	18	3	21	27
185. Wounds (by Fall) ..	—	9	—	9	—	38	2	40	49
186. Wounds (in Mines or Quarries)	—	—	—	—	—	—	—	—	—
187. Wounds (by Ma- chinery)	—	2	—	2	—	2	—	2	4
188. Wounds (crushing, e.g., railway accidents, etc.)	—	6	—	6	—	3	1	4	10
Carried forward ..	28	1,614	29	1,642	32	1,883	781	2,664	4,306

TABLES V AND VI—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
Brought forward ..	28	1,614	29	1,642	32	1,883	781	2,664	4,306
189. Injuries inflicted by Animals, Bites, Kicks, etc.	—	6	3	6	—	17	3	20	26
190. Wounds inflicted on Active Service ..	—	—	—	—	—	—	—	—	—
191. Executions of civilians by belligerents ..	—	—	—	—	—	—	—	—	—
192. A.—Over fatigue ..	—	—	—	—	—	—	—	—	—
B.—Hunger or Thirst ..	—	—	—	—	—	—	—	—	—
193. Exposure to Cold, Frost Bite, etc. ..	—	—	—	—	—	—	—	—	—
194. Exposure to Heat—Heat Stroke ..	—	1	—	1	—	—	—	—	1
Sunstroke ..	—	3	—	3	—	—	—	—	3
195. Lightning Stroke ..	—	—	—	—	—	—	—	—	—
196. Electric Shock ..	—	—	—	—	—	—	—	—	—
197. Murder by Firearms ..	—	—	—	—	—	—	—	—	—
198. Murder by Cutting or Stabbing Instruments ..	—	—	—	—	—	—	—	—	—
199. Murder by other means ..	—	—	—	—	—	—	—	—	—
200. Infanticide (murder of an infant under one year) ..	—	—	—	—	—	—	—	—	—
201. A.—Dislocation ..	1	4	—	5	—	1	—	1	6
B.—Sprain ..	—	8	—	8	—	28	7	35	43
C.—Fracture ..	1	18	—	19	—	19	3	22	41
202. Other injuries ..	—	17	—	17	—	74	15	89	106
203. Deaths by Violence of unknown cause ..	—	—	—	—	—	—	—	—	—
XV.—Ill-Defined Diseases.									
204. Sudden Death (cause unknown) ..	—	—	—	—	—	—	—	—	—
205. A.—Diseases not already specified or ill-defined—									
Ascaris ..	—	—	—	—	—	1	—	1	1
Edema ..	—	—	—	—	—	1	—	1	1
Asthenia ..	—	—	—	—	—	9	4	13	13
Shock ..	—	—	—	—	—	1	—	1	1
Hyperpyrexia ..	—	—	—	—	—	—	—	—	—
Neuralgia and Headache ..	—	5	—	5	—	5	3	8	13
Not yet Diagnosed ..	—	—	—	—	—	—	—	—	—
Pyrexia of uncertain origin..	1	43	—	44	1	12	4	16	60
Debility..	—	4	—	4	—	22	10	32	36
Other Diseases..	—	1	—	1	—	2	—	2	3
B.—Malingering ..	—	—	—	—	—	—	—	—	—
TOTAL ..	31	1,724	32	1,755	33	2,075	830	2,905	4,660

TABLES V AND VI.

NATIVE POPULATION.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928.

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
I.—Epidemic, Endemic, and Infectious Diseases.									
1. Enteric Group—									
(a) Typhoid Fever ..	1	28	2	29	3	2	—	2	31
(b) Paratyphoid A ..	—	5	—	5	—	—	—	—	5
(c) Paratyphoid B ..	—	1	1	1	—	—	—	—	1
(d) Type not defined ..	—	2	1	2	—	—	—	—	2
2. Typhus ..	—	1	—	1	—	—	—	—	1
3. Relapsing Fever ..	6	226	1	232	3	86	24	110	342
4. Undulant Fever ..	—	—	—	—	—	—	—	—	—
5. Malaria—									
(a) Tertian	16	880	4	896	15	3,945	1,607	5,552	6,448
(b) Quartan	—	4	—	4	1	40	14	54	58
(c) Aestivo-autumnal ..	29	3,629	25	3,658	37	15,282	2,800	18,082	21,740
(d) Cachexia	4	140	9	144	9	445	133	578	722
(e) Blackwater	1	62	15	63	1	4	—	4	67
(f) Cerebral	—	12	8	12	—	3	—	3	15
(g) Unclassified	3	332	1	335	2	3,401	1,002	4,403	4,738
6. Smallpox	—	14	—	14	—	1	4	5	19
Alastrim	—	—	—	—	—	—	—	—	—
7. Measles	—	79	—	79	—	560	237	797	876
8. Scarlet Fever	—	—	—	—	—	—	—	—	—
9. Whooping Cough ..	—	21	—	21	2	84	51	135	156
10. Diphtheria	—	2	—	2	2	—	2	2	4
11. Influenza	29	735	8	764	7	4,141	1,276	5,417	6,181
12. Miliary Fever	—	—	—	—	—	—	—	—	—
13. Mumps	—	9	—	9	—	47	22	69	78
14. Cholera	—	—	—	—	—	—	—	—	—
15. Epidemic Diarrhœa ..	—	—	—	—	—	—	—	—	—
16. Dysentery—									
(a) Amœbic	16	277	31	293	4	229	80	309	602
(b) Bacillary	1	124	14	125	3	78	41	119	244
(c) Undefined or due to other causes ..	1	199	22	200	11	393	125	518	718
17. Plague—									
(a) Bubonic	—	10	8	10	—	—	—	—	10
(b) Pneumonic	—	—	—	—	—	—	—	—	—
(c) Septicæmic	—	—	—	—	—	—	—	—	—
(d) Undefined	—	—	—	—	—	—	—	—	—
18. Yellow Fever	—	—	—	—	—	—	—	—	—
19. Spirochætosis ictero-hæmorrhagica	—	—	—	—	—	—	—	—	—
20. Leprosy	8	195	8	203	74	287	187	474	677
21. Erysipelas	—	3	—	3	—	5	3	8	11
22. Acute Poliomyelitis ..	1	1	—	2	—	—	—	—	2
23. Encephalitis Lethar- gica	—	1	—	1	—	—	—	—	1
24. Epidemic Cerebro- spinal Fever	—	9	6	9	—	—	—	—	9

TABLES V AND VI—*continued.*RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
25. Other Epidemic Diseases—									
(a) Rubeola (German Measles)	—	—	—	—	—	—	—	—	—
(b) Varicella (Chicken-pox)	5	280	—	285	3	85	19	104	389
(c) Kala Azar	—	—	—	—	—	—	—	—	—
(d) Phlebotomus Fever	—	—	—	—	—	—	—	—	—
(e) Dengue	—	6	—	6	—	2	1	3	9
(f) Epidemic Dropsy	—	—	—	—	—	—	—	—	—
(g) Yaws	182	3,333	15	3,515	140	42,484	34,414	76,898	80,413
(h) Trypanosomiasis	3	137	23	140	44	262	175	437	577
(i) Rat-bite Fever	—	1	—	1	—	—	—	—	1
26. Glanders	—	—	—	—	—	—	2	2	2
27. Anthrax	—	2	—	2	—	4	1	5	7
28. Rabies	—	—	—	—	—	1	—	1	1
29. Tetanus	4	16	13	20	1	2	—	2	22
30. Mycosis	—	3	—	3	—	18	10	28	31
31. Tuberculosis, Pul- monary and Laryn- geal	27	320	88	347	30	149	56	205	552
32. Tuberculosis of the Meninges or Central Nervous System	—	4	2	4	—	1	—	1	5
33. Tuberculosis of the Intestines or Peri- toneum	1	7	1	8	—	3	3	6	14
34. Tuberculosis of the Vertebral Column	1	23	—	24	4	3	—	3	27
35. Tuberculosis of Bones and Joints	1	14	—	15	2	7	5	12	27
36. Tuberculosis of other Organs—									
(a) Skin or Subcuta- neous Tissue (Lupus)	—	7	1	7	—	1	2	3	10
(b) Bones	—	3	1	3	—	1	—	1	4
(c) Lymphatic System	1	38	—	39	5	13	7	20	59
(d) Genito-urinary	1	1	—	2	1	—	—	—	2
(e) Other Organs	—	5	—	5	—	6	—	6	11
37. Tuberculosis dis- seminated—									
(a) Acute	—	4	3	4	—	5	3	8	12
(b) Chronic	—	2	—	2	—	4	—	4	6
38. Syphilis—									
(a) Primary	23	441	1	464	15	2,060	1,368	3,428	3,892
(b) Secondary	14	462	6	476	13	2,433	1,946	4,379	4,855
(c) Tertiary	27	416	5	443	31	3,636	3,773	7,409	7,852
(d) Hereditary	1	26	2	27	2	204	155	359	386
(e) Period not indi- cated	—	33	—	33	—	803	439	1,242	1,275
39. Soft Chancre	—	34	—	34	—	114	3	117	151

TABLES V AND VI—*continued.*RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
40. A.—Gonorrhœa and its complications ..	31	802	3	833	29	4,313	773	5,086	5,919
B.—Gonorrhœal Oph- thalmia	—	14	—	14	—	36	13	49	63
C.—Gonorrhœal Ar- thritis	—	4	—	4	—	129	16	145	149
D.—Granuloma Ve- nereum	—	5	—	5	—	3	—	3	8
41. Septicæmia	—	10	6	10	1	1	—	1	11
42. Other Infectious Diseases	—	—	—	—	—	—	—	—	—
II.—General Diseases not mentioned above.									
43. Cancer or other malig- nant Tumours of the Buccal Cavity	1	4	2	5	—	—	3	3	8
44. Cancer or other malig- nant Tumours of the Stomach or Liver ..	—	9	8	9	1	2	1	3	12
45. Cancer or other malig- nant Tumours of the Peritoneum, Intestines, Rectum	—	4	2	4	—	—	1	1	5
46. Cancer or other malig- nant Tumours of the Female Genital Organs	—	9	4	9	1	—	4	4	13
47. Cancer or other malig- nant Tumours of the Breast	—	6	2	6	1	1	1	2	8
48. Cancer or other malig- nant Tumours of the Skin	2	6	2	8	—	2	1	3	11
49. Cancer or other malig- nant Tumours of the Organs not specified ..	2	20	5	22	2	2	5	7	29
50. Tumours, non-malig- nant	4	110	1	114	7	50	42	92	206
51. Acute Rheumatism ..	2	84	2	86	—	625	280	905	991
52. Chronic Rheumatism	1	140	3	141	9	1,578	514	2,092	2,233
53. Scurvy (including Barlow's Disease) ..	—	26	—	26	—	419	107	526	552
54. Pellagra	—	2	—	2	1	1	—	1	3
55. Beriberi	3	34	3	37	5	—	—	—	37
56. Rickets	—	2	—	2	—	20	9	29	31
57. Diabetes (not includ- ing Insipidus)	—	5	2	5	—	10	4	14	19

TABLES V AND VI—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
58. Anæmia—									
(a) Pernicious	7	25	2	32	5	69	23	92	124
(b) Other Anæmias and Chlorosis	—	139	10	139	13	531	202	733	872
59. Diseases of the Pituitary Body ..	—	—	—	—	—	1	—	1	1
60. Diseases of the Thy-roid Gland—									
(a) ExophthalmicGoitre ..	—	3	—	3	—	9	1	10	13
(b) Other Diseases of the Thyroid Gland, Myxœdema	—	6	—	6	1	9	4	13	19
61. Diseases of the Para-Thyroid Glands ..	—	—	—	—	—	—	—	—	—
62. Diseases of the Thy-mus	—	—	—	—	—	—	—	—	—
63. Diseases of the Supra-Renal Glands	—	—	—	—	—	—	—	—	—
64. Diseases of the Spleen	1	14	—	15	—	335	163	498	513
65. Leukæmia—									
(a) Leukæmia	1	2	—	3	—	—	1	1	4
(b) Hodgkin's Disease ..	—	1	1	1	—	—	—	—	1
66. Alcoholism	—	8	2	8	—	1	—	1	9
67. Chronic Poisoning by mineral substances (lead, mercury, etc.) ..	—	—	—	—	—	—	—	—	—
68. Chronic Poisoning by organic substances (morphia, cocaine, etc.) ..	—	—	—	—	—	—	—	—	—
69. Other General Diseases—									
Auto-intoxication ..	—	—	—	—	—	1	1	2	2
Purpura Hæmorrhagica ..	—	2	—	2	—	—	1	1	3
Hæmophilia	—	—	—	—	—	—	—	—	—
Diabetes Insipidus ..	—	—	—	—	—	2	—	2	2
Others	2	—	—	2	—	8	—	8	10
III.—Affections of the Nervous System and Organs of the Senses.									
70. Encephalitis (not in-cluding Encephalitis Lethargica)	—	1	—	1	—	—	1	1	2
71. Meningitis (not includ- ing Tuberculosis, Menin- gitis or Cerebro-spinal Meningitis)	1	17	9	18	—	7	3	10	28
72. Locomotor Ataxia ..	—	6	1	6	1	4	—	4	10

TABLES V AND VI—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
73. Other affections of the Spinal Cord	4	5	1	9	1	4	2	6	15
74. Apoplexy—									
(a) Hemiplegia	—	46	8	46	5	13	2	15	61
(b) Embolism	—	4	3	4	—	—	—	—	4
(c) Thrombosis	—	1	1	1	—	—	—	—	1
75. Paralysis—									
(a) Hæmorrhage	3	10	4	13	2	7	1	8	21
(b) Other Paralysis ..	5	23	2	28	4	40	8	48	76
76. General Paralysis of the Insane	—	2	—	2	—	1	—	1	3
77. Other forms of Mental Alienation	4	69	3	73	5	28	10	38	111
78. Epilepsy	3	80	6	83	1	98	37	135	218
79. Eclampsia, Convul- sions (non-puerperal), 5 years and over.. ..	—	1	1	1	—	—	—	—	1
80. Infantile Convulsions	—	5	2	5	—	5	3	8	13
81. Chorea	—	1	—	1	—	1	1	2	3
82. A.—Hysteria.. ..	—	10	—	10	—	10	9	19	29
B.—Neuritis	1	63	—	64	1	862	185	1,047	1,111
C.—Neurasthenia ..	2	29	—	31	—	332	72	404	435
83. Cerebral Softening ..	—	1	—	1	—	1	—	1	2
84. Other affections of the Nervous System, such as Paralysis Agitans ..	—	34	2	34	3	900	207	1,107	1,141
85. Affections of the Organs of Vision—									
(a) Diseases of the Eye	6	31	—	37	2	111	37	148	185
(b) Conjunctivitis ..	12	452	—	464	11	10,302	6,386	16,688	17,152
(c) Trachoma	—	43	—	43	1	288	94	382	425
(d) Tumours of the Eye	2	6	—	8	1	3	2	5	13
(e) Other affections of the Eye	3	328	1	331	23	1,251	432	1,683	2,014
86. Affections of the Ear or Mastoid Sinus ..	6	93	1	99	3	4,114	1,810	5,924	6,023
IV.—Affections of the Circulatory System.									
87. Pericarditis	1	3	2	4	—	10	5	15	19
88. Acute Endocarditis or Myocarditis ..	—	11	3	11	—	3	1	4	15
89. Angina Pectoris ..	—	4	2	4	—	1	1	2	6
90. Other Diseases of the Heart—									
(a) Valvular—									
Mitral	1	28	4	29	—	36	12	48	77
Aortic	—	2	—	2	—	3	—	3	5
Tricuspid	—	—	—	—	—	1	—	1	1
Pulmonary	—	—	—	—	—	—	—	—	—
(b) Myocarditis ..	—	6	2	6	—	8	3	11	17

TABLES V AND VI—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
91. Diseases of the Arteries—									
(a) Aneurism	—	2	—	2	1	7	2	9	11
(b) Arterio-Sclerosis ..	—	1	—	1	—	1	1	2	3
(c) Other Diseases ..	—	—	—	—	—	4	2	6	6
92. Embolism or Throm- bosis (non-cerebral) ..	—	2	—	2	—	—	—	—	2
93. Diseases of the Veins—									
Hæmorrhoids	1	30	—	31	1	93	7	100	131
Varicose	—	2	—	2	—	24	4	28	30
Phlebitis	—	6	—	6	—	15	1	16	22
94. Diseases of the Lym- phatic System—									
Filariasis	2	45	—	47	2	29	7	36	83
Lymphangitis	—	15	—	15	—	125	10	135	150
Lymphadenitis, Bubo (non-specific) ..	—	97	—	97	5	601	61	662	759
95. Hæmorrhage of un- determined cause ..	—	7	1	7	1	11	3	14	21
96. Other affections of the Circulatory System	—	12	—	12	—	67	13	80	92
V.—Affections of the Respiratory System.									
97. Diseases of the Nasal Passages—									
Adenoids	—	7	—	7	—	5	2	7	14
Polypus.. ..	—	—	—	—	—	9	2	11	11
Rhinitis.. ..	1	5	—	6	—	50	17	67	73
Coryza	4	106	1	110	—	1,852	444	2,296	2,406
98. Affections of the Larynx—Laryngitis	—	20	1	20	—	196	77	273	293
99. Bronchitis—									
(a) Acute	8	610	2	618	13	19,039	6,517	25,556	26,174
(b) Chronic	10	257	1	267	14	4,904	1,973	6,877	7,144
(c) Unclassified ..	4	80	2	84	1	2,111	826	2,937	3,021
100. Broncho-Pneumonia	6	178	58	184	—	94	62	156	340
101. Pneumonia—									
(a) Lobar	16	698	128	714	22	167	43	210	924
(b) Unclassified ..	2	31	10	33	1	16	2	18	51
102. Pleurisy, Empyema	—	182	7	182	6	200	54	254	436
103. Congestion of the Lungs	—	—	—	—	—	2	—	2	2
104. Gangrene of the Lungs	—	5	5	5	—	—	—	—	5
105. Asthma	2	111	3	113	1	622	131	753	866
106. Pulmonary Em- physema	—	1	—	1	—	9	4	13	14

TABLES V AND VI—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
107. Other affections of the Lungs— Pulmonary Spiro- chætosis Other affections of the Respiratory System	— —	19 7	— —	19 7	— —	2 257	— 32	2 289	21 296
VI.—Diseases of the Digestive System.									
108. A.—Diseases of Teeth or Gums— Caries, Pyorrhœa, etc. B.—Other affections of the Mouth.. Stomatitis .. Glossitis, etc. ..	1 1 — —	114 9 33 4	1 2 — —	115 10 33 4	3 — 1 —	6,367 141 1,120 75	3,153 113 451 26	9,520 154 1,571 101	9,635 164 1,604 105
109. Affections of the Pharynx or Tonsils— Tonsillitis Pharyngitis	1 —	125 46	— —	126 46	3 1	1,550 1,499	489 383	2,039 2,882	2,165 2,928
110. Other affections of the Œsophagus ..	—	5	1	5	—	16	3	19	24
111. A.—Ulcer of the Stomach B.—Ulcer of the Duodenum ..	— —	11 3	— —	11 3	— —	7 1	— —	7 1	18 4
112. Other affections of the Stomach— Gastritis Dyspepsia, etc. ..	1 2	75 61	1 —	76 63	2 —	481 1,671	194 775	675 2,446	751 2,509
113. Diarrhœa and Enteritis— Under two years ..	1	342	33	343	12	1,633	847	2,480	2,823
114. Diarrhœa and Enteritis— Two years and over .. Colitis Ulceration	8 1 —	554 94 5	24 — 3	562 95 5	1 — —	3,749 1,735 16	1,066 574 5	3,815 2,309 21	4,377 2,404 26
114A. Sprue	—	4	—	4	1	—	—	—	4
115. Ankylostomiasis ..	45	1,220	202	1,265	85	4,037	3,108	7,145	8,410
116. Diseases due to Intes- tinal Parasites— (a) Cestoda (Tænia) .. (b) Trematoda (Flukes)	4 —	218 8	— 1	222 8	2 —	4,827 43	1,564 9	6,391 52	6,613 60

TABLES V AND VI—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
116. Diseases due to Intes- tinal Parasites— <i>cont.</i>									
(c) Nematoda (other than Ankylostoma)	—	5	—	5	—	59	10	69	74
Ascaris	1	56	2	57	2	2,568	1,620	4,188	4,245
TrichocephalusDispar	—	—	—	—	—	5	—	5	5
Trichina	—	—	—	—	—	—	—	—	—
Dracunculus	—	—	—	—	—	—	—	—	—
Strongylus	—	2	—	2	—	8	—	8	10
Oxyuris	1	—	—	1	—	16	1	17	18
(d) Coccidia	—	—	—	—	—	—	—	—	—
(e) Other Parasites	—	1	—	1	—	1	1	2	3
(f) Unclassified	—	1	—	1	—	—	3	3	4
117. Appendicitis	1	25	2	26	3	6	2	8	34
118. Hernia	9	311	9	320	13	194	7	201	521
119. A.—Affections of the Anus, Fistula, etc.	1	40	1	41	1	40	13	53	94
B.—Other affections of the Intestines									
Enteroptosis	1	58	2	59	—	17	5	22	81
Constipation	11	272	—	283	—	18,731	6,683	25,414	25,697
120. Acute Yellow Atro- phy of the Liver	—	2	—	2	—	—	—	—	2
121. Hydatid of the Liver	—	2	—	2	—	2	—	2	4
122. Cirrhosis of the Liver—									
(a) Alcoholic	1	7	6	8	1	1	1	2	10
(b) Other forms	1	16	5	17	—	16	3	19	36
123. Biliary Calculus	—	—	—	—	—	2	—	2	2
124. Other affections of the Liver—									
Abscess	2	20	4	22	2	17	4	21	43
Hepatitis	1	79	2	80	4	153	45	198	278
Cholecystitis	—	3	—	3	—	5	3	8	11
Jaundice	1	30	4	31	—	71	24	95	126
125. Diseases of the Pancreas	—	1	—	1	—	1	—	1	2
126. Peritonitis (of un- known cause)	—	1	1	1	—	4	—	4	5
127. Other affections of the Digestive System..	—	116	2	116	2	831	387	1,218	1,334
VII.—Diseases of the Genito - Urinary System (Non- Venereal).									
128. Acute Nephritis	1	27	7	28	1	25	24	49	77
129. Chronic Nephritis	2	22	9	24	1	15	4	19	43
130. A.—Chyluria	—	—	—	—	—	—	—	—	—
B.—Schistosomiasis	4	255	—	259	3	1,400	279	1,679	1,938

TABLES V AND VI—*continued.*RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
131. Other affections of the Kidneys—Pyelitis, etc.	—	18	—	18	—	30	9	39	57
132. Urinary Calculus . .	—	8	—	8	—	8	—	8	16
133. Diseases of the Bladder—Cystitis . .	—	41	1	41	3	109	22	131	172
134. Diseases of the Urethra—									
(a) Stricture	3	76	4	79	4	49	1	50	129
(b) Other	—	23	—	23	1	52	8	60	83
135. Diseases of the Prostate—									
Hypertrophy	—	2	—	2	1	2	—	2	4
Prostatitis	—	5	1	5	—	6	—	6	11
136. Diseases (non-venereal) of the Genital Organs of Man—									
Epididymitis	6	77	—	83	2	75	—	75	158
Orchitis	—	136	—	136	2	679	—	679	815
Hydrocele	18	386	1	404	24	151	—	151	555
Ulcer of Penis	1	86	1	87	1	64	—	64	151
137. Cysts or other non-malignant Tumours of the Ovaries	3	5	1	8	—	—	8	8	16
138. Salpingitis—	—	4	—	4	—	—	9	9	13
Abscess of the Pelvis . .	—	—	—	—	—	1	4	5	5
139. Uterine Tumours (non-malignant) . .	—	10	—	10	—	—	6	6	16
140. Uterine Hæmorrhage (non-puerperal) . .	1	8	—	9	1	—	41	41	50
141. A.—Metritis	3	9	—	12	—	—	51	51	63
B.—Other affections of the Female Genital Organs	—	22	—	22	2	—	55	55	77
Displacement of Uterus	—	3	—	3	—	—	9	9	12
Amenorrhœa	—	—	—	—	—	—	64	64	64
Dysmenorrhœa	—	7	—	7	—	—	159	159	166
Leucorrhœa	—	2	—	2	—	—	26	26	28
142. Diseases of the Breast (non-puerperal)	—	6	1	6	—	—	29	29	35
Mastitis	—	11	—	11	—	14	211	225	236
Abscess of Breast	—	9	—	9	1	—	138	138	147

TABLES V AND VI—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
VIII.—Puerperal State.									
143. A.—Normal Labour	6	173	1	179	1	—	83	83	262
B.—Accidents of Pregnancy—									
(a) Abortion ..	1	42	2	43	—	—	32	32	75
(b) Ectopic Gestation ..	—	—	—	—	—	—	2	2	2
(c) Other accidents of Pregnancy ..	1	22	5	23	—	—	26	26	49
144. Puerperal Hæmorrhage ..	—	6	1	6	—	—	4	4	10
145. Other accidents of Parturition ..	1	34	7	35	—	—	33	33	68
146. Puerperal Septicæmia ..	—	3	2	3	—	—	4	4	7
147. Phlegmasia Dolens..	—	1	—	1	—	—	—	—	1
148. Puerperal Eclampsia	—	3	1	3	—	—	—	—	3
149. Sequelæ of Labour..	—	2	—	2	—	—	8	8	10
150. Puerperal affections of the Breast ..	—	1	—	1	—	—	6	6	7
IX.—Affections of the Skin and Cellular Tissues.									
151. Gangrene ..	6	41	15	47	4	12	18	30	77
152. Boil ..	4	120	1	124	—	1,769	221	1,990	2,114
153. Carbuncle ..	28	30	2	58	3	12	1	13	71
Abscess ..	1	598	11	599	32	1,689	406	2,095	2,694
Whitlow ..	—	20	—	20	1	260	81	341	361
Cellulitis ..	25	353	10	378	11	2,103	368	2,471	2,849
Ulcer ..	170	2,521	23	2,691	172	17,883	5,000	22,883	25,574
154. A.—Tinia ..	—	13	—	13	—	274	90	364	377
B.—Scabies ..	4	166	—	170	3	6,266	2,363	8,629	8,799
155. Other Diseases of the Skin—									
Erythema ..	—	—	—	—	—	—	—	—	—
Urticaria ..	—	23	—	23	1	181	42	223	246
Eczema ..	1	75	—	76	5	949	327	1,276	1,352
Herpes ..	—	11	—	11	—	85	23	108	119
Psoriasis ..	—	12	—	12	—	42	13	55	67
Elephantiasis ..	19	176	6	195	16	144	45	189	384
Myiasis ..	3	8	—	11	—	141	59	200	211
Chigoes ..	4	97	1	101	5	1,155	369	1,524	1,625
Cutaneous Leishmaniasis ..	—	6	—	6	—	6	3	9	15
Others ..	16	74	3	90	2	451	110	561	651

TABLES V AND VI—continued.

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued*.

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TABLES V AND VI—*continued.*RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
169. Suicide by Drowning	—	—	—	—	—	—	—	—	—
170. Suicide by Firearms	—	1	1	1	—	—	—	—	1
171. Suicide by Cutting or Stabbing Instruments	—	1	1	1	—	—	—	—	1
172. Suicide by Jumping from a Height	—	—	—	—	—	—	—	—	—
173. Suicide by Crushing	—	—	—	—	—	—	—	—	—
174. Other Suicides ..	—	—	—	—	—	—	—	—	—
175. Food Poisoning ..	—	11	—	11	—	9	3	12	23
Botulism	—	1	—	1	—	—	—	—	1
176. Attacks of Poisonous Animals—									
Snake Bite	1	46	1	47	—	116	23	139	186
Insect Bite	—	20	—	20	—	159	28	187	207
Others	—	4	—	4	—	11	3	14	18
177. Other Accidental Poisonings	1	8	1	9	—	1	—	1	10
178. Burns (by Fire) ..	3	126	12	129	12	694	272	966	995
179. Burns (other than by Fire)	2	24	—	26	1	184	33	217	243
180. Suffocation (acci- dental)	—	—	—	—	—	—	—	—	—
181. Poisoning by Gas (accidental)	—	—	—	—	—	—	—	—	—
182. Drowning (acci- dental)	—	—	—	—	—	—	—	—	—
183. Wounds (by Fire- arms, war excepted) ..	4	52	2	56	4	22	—	22	78
184. Wounds (by Cutting or Stabbing Instru- ments)	31	398	18	429	26	7,105	921	8,026	8,455
185. Wounds (by Fall) ..	15	361	4	376	7	5,319	1,000	6,319	6,695
186. Wounds (in Mines or Quarries)	1	46	—	47	2	106	1	107	154
187. Wounds (by Ma- chinery)	5	174	4	179	11	512	—	512	691
188. Wounds (crushing, e.g., railway accidents, etc.)	2	83	7	85	4	71	1	72	157
189. Injuries inflicted by Animals, Bites, Kicks, etc.	13	186	21	199	11	1,317	448	1,765	2,064
190. Wounds inflicted on Active Service	—	—	—	—	—	1	—	1	1
191. Executions of civi- lians by belligerents ..	—	—	—	—	—	—	—	—	—
192. A.—Over fatigue ..	—	4	1	4	—	3	—	3	7
B.—Hunger or Thirst	—	3	—	3	—	—	—	—	3
193. Exposure to Cold, Frost Bite, etc. ..	—	—	—	—	—	20	2	22	22

TABLES V AND VI—*continued.*

RETURN OF DISEASES AND DEATHS (IN-PATIENTS) AND OF DISEASES (OUT-PATIENTS)
FOR THE YEAR 1928—*continued.*

DISEASES.	IN-PATIENTS.					OUT-PATIENTS.			Total Cases, In- and Out-Patients.
	Remained in Hospitals at the end of 1927.	Yearly Total.		Total Cases Treated.	Remain- ing in Hospitals at the end of 1928.	Males.	Females.	Total.	
		Admis- sions.	Deaths.						
194. Exposure to Heat— Sunstroke	—	4	—	4	—	—	1	1	5
Heat Stroke	—	—	—	—	—	—	—	—	—
195. Lightning Stroke ..	—	1	—	1	—	—	—	—	1
196. Electric Shock ..	—	—	—	—	—	—	—	—	—
197. Murder by Firearms	—	—	—	—	—	—	—	—	—
198. Murder by Cutting or Stabbing Instruments	—	—	—	—	—	—	—	—	—
199. Murder by other means	—	—	—	—	—	—	—	—	—
200. Infanticide (murder of an infant under one year)	—	—	—	—	—	—	—	—	—
201. A.—Dislocation ..	3	35	1	38	—	52	10	62	100
B.—Sprain	3	109	—	112	3	1,116	144	1,260	1,372
C.—Fracture	22	297	15	319	27	77	18	95	414
202. Other injuries ..	25	821	6	846	40	10,926	1,599	12,525	13,371
203. Deaths by Violence of unknown cause ..	—	—	—	—	—	—	—	—	—
XV.—Ill-Defined Diseases.									
204. Sudden Death (cause unknown)	—	—	—	—	—	—	—	—	—
205. A.—Diseases not already specified or ill-defined—									
Ascites	4	56	9	60	5	28	14	42	102
Œdema	—	13	2	13	2	57	16	73	86
Asthenia	—	7	3	7	—	61	20	81	88
Shock	—	1	—	1	—	1	—	1	2
Hyperpyrexia	—	8	—	8	1	39	13	52	60
Neuralgia and Headache	2	55	—	57	—	1,293	293	1,586	1,643
Not yet Diagnosed ..	—	5	1	5	—	3	—	3	8
Pyrexia of uncertain origin.. ..	12	124	4	136	3	232	49	281	417
Debility	—	18	—	18	—	48	17	65	83
Others	—	8	1	8	—	82	55	137	145
B.—Malingering ..	—	3	—	3	—	22	1	23	26
TOTAL	1,181	31,613	1,233	32,794	1,301	261,933	110,831	372,764	405,558
Total Cases treated by Medical Staff on tour..	—	148	4	148	—	49,769	37,148	86,917	87,065
Total Cases treated by African Dispensers ..	—	691	41	691	—	16,510	10,337	26,847	27,538
Total Cases treated by Missionaries supplied with Government drugs and equipment..	—	—	—	—	—	3,360	2,621	5,981	5,981
GRAND TOTAL ..	1,181	32,452	1,278	33,633	1,301	331,572	160,937	492,509	526,142

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